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REPORT

To The

MONTANA LIVESTOCK SANITARY BOARD

December 1, 1950 -- June 30, 1952

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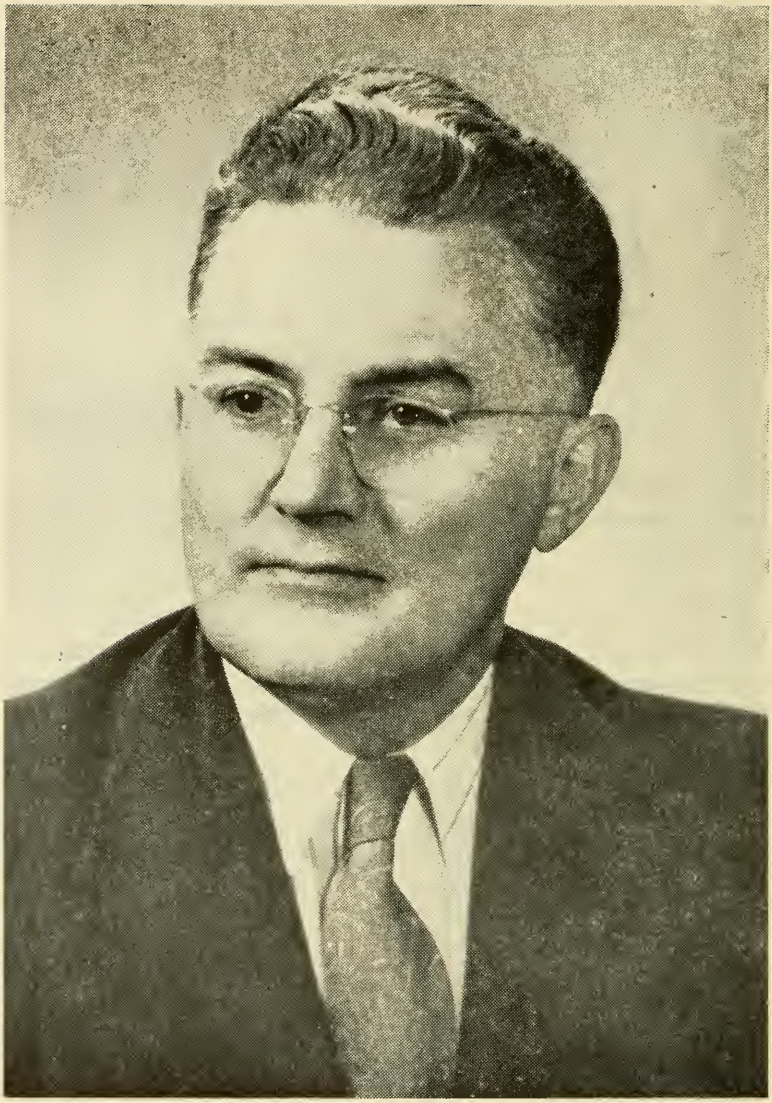
Helena, Montana
July 1, 1952

Honorable John W. Bonner,
Governor of Montana
Helena, Montana

Dear Governor Bonner:

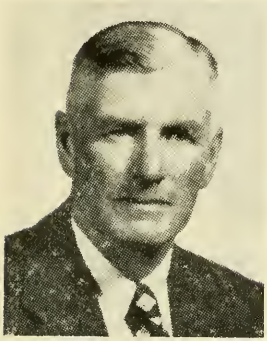
In compliance with Title 46, Section 242, Revised Codes of Montana, 1947, we transmit herewith the report of the State Veterinary Surgeon to the Montana Livestock Sanitary Board for the period December 1, 1951 through June 30, 1952.

Respectfully submitted,
MONTANA LIVESTOCK SANITARY BOARD
H. F. WILKINS, D. V. M.
Secretary and Executive Officer



H. F. WILKINS, D.V.M.
State Veterinary Surgeon
Secretary and Executive Officer
Director of Laboratories

MONTANA LIVESTOCK SANITARY BOARD



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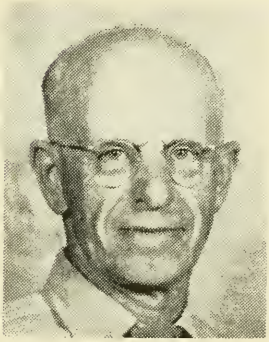
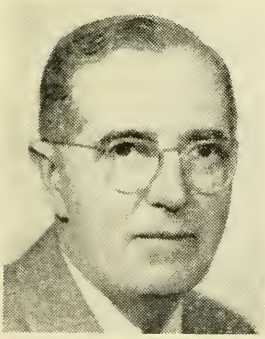


PETER ITCAINA
Dodson



W. G. RAGEN
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State Veterinary Surgeon
Executive Officer
Director of Laboratories

A. M. JASMIN, B. S., D. V. M., Bacteriologist & Pathologist
*HADLEIGH MARSH, D. V. M., Veterinary Pathologist
*LOUIS DS. SMITH, B. S., M. S., Ph. D., Associate Bacteriologist
HAZEL L. HAMMERSLAND, Laboratory Technician
JAMES GLOSSER (Agent) Biological Aid, U. S. D. A.
LOUIS W. CORMIER, Laboratory Assistant

*Located at the Veterinary Research Laboratory, Bozeman, Montana. Employed jointly by the Veterinary Research Laboratory and the Livestock Sanitary Board.

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Head, Field Investigations

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VIRGINIA L. STRATTON, Secretary to Executive Officer
HARRY C. W. RICHTER, Assistant Clerk
NELLIE SMITH, Part-Time Stenographer

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DR. H. E. FURGESON, Butte
DR. S. D. GATES, Lewistown
DR. G. C. HALVER, Glendive
DR. H. W. JACOBSON, Havre
DR. I. A. PHINNEY, Kalispell
DR. F. M. NELSON, Livingston
DR. E. W. SPRATLIN, Glasgow
DR. G. M. WRIGHT, Billings
DR. W. E. STAHL, Missoula

JUNIOR DISTRICT DEPUTY STATE VETERINARY SURGEONS

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DR. J. D. MELCHER, Forsyth
DR. L. E. WITT, Sidney

MILK SANITARIAN

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DR. F. J. YOUNGLOVE, Missoula
DR. WASYL HRYCKIW, Havre
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Dr. A. W. Elting, Miles City
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Dr. C. E. Stineberg, Chinook
Dr. R. C. Timmons, Havre
Dr. G. L. Utley, Twin Bridges
Dr. I. W. Vinsel, Dillon
Dr. Smith Willis, Kalispell
Dr. A. T. Zancanella, Billings

REPORT TO THE MONTANA LIVESTOCK SANITARY BOARD

Honorable Livestock Sanitary Board
Helena, Montana

Helena, Montana
July 1, 1952

Gentlemen:

In compliance with Title 46, Section 242, Revised Codes of Montana, 1947, we submit the report of the State Veterinary Surgeon and Executive Officer to the Montana Livestock Sanitary Board for the year December 1, 1950, through November 30, 1951, and the 7-month period from December 1, 1951, through June 30, 1952.

There were six meetings of the Montana Livestock Sanitary Board held during the year 1951 and the first six months of 1952:

The annual meeting was held at Miles City on Monday and Tuesday, March 5 and 6, 1951.

The second meeting was held at Great Falls on May 23 through May 26, 1951.

The annual meeting for 1952 was held at Helena on March 3 and 4, 1952.

A meeting was held in Helena on March 29, 1952.

A special meeting was held in Helena on April 1, 1952.

A meeting was held in Helena May 21, 1952, and was continued in Butte on May 22 and 23, 1952.

At these meetings matters pertaining to the duties of the Montana Livestock Sanitary Board and of interest to the livestock industry were discussed at length and acted upon.

All actions, regulations and orders promulgated by the Executive Officer, during the interim between meetings, were approved.

The complete minutes of all meetings are on file in the office of the Secretary, at the Livestock Building in Helena, Montana.

FOREWORD

The year 1951 was a most successful one for livestock operators in Montana. With the exception of a few isolated areas, there was an abundance of feed and excellent prices prevailed for all classes of livestock. Cattle and sheep both sold at prices far exceeding the fondest hopes of the greatest optimist.

The winter of 1951-52 was exceptionally long with an unusually deep snow cover, all over the State. The deep snow precluded the use of grass on the range, with the result that Montana came out of the winter with one of its smallest supplies of reserve feeds on record, and probably with more cattle.

Winter losses were light and much less than had been anticipated. The spring was relatively dry in most of eastern Montana which resulted in a short grass crop for summer grazing and for the coming winter.

Because of the favorable summer feed situation in 1951, thousands of head of cattle were shipped into Montana from practically every section of the United States and Canada. Many cattle were imported from the drought sections of the Southwest but some even came from the swamps of Florida, Louisiana and Georgia in the deep south. Again, in the spring of 1952, thousands of cattle were imported with the hope that Montana would continue to have more than normal rainfall.

From a disease-control point of view, this is not good, since many of the states from which we have received livestock have diseases which we do not have at all, or if we do, only in a very limited way. Some of these diseases are anaplasmosis, leptospirosis, listerellosis, Q fever, mange, and eperythrozoonosis of swine. While all animals are required to be inspected, some diseases cannot be detected by inspection alone.

The future success of our livestock industry will depend, to a large extent upon the maintenance of disease-free animals. Many factors enter into a livestock operation—adequate feed with all the essential nutritional elements in the proper proportions; plenty of pure, fresh water; potent breeding stock free from transmissible tendencies toward dwarfism, cancer eye, slow development, unthriftiness on native feeds, and irregular breeding, BUT THE

ONE PRINCIPAL DETERRENT TO SUCCESSFUL LIVESTOCK PRODUCTION IS DISEASE. Fully cognizant of its importance, the Livestock Sanitary Board has put forth every effort to eradicate all diseases which can be eradicated and to assist in better control of those with which we must live.

Those diseases (infectious or parasitic) which can be eradicated, and which are ruinous or a severe handicap to successful livestock production are: foot-and-mouth disease, rinderpest, contagious pleuropneumonia, tuberculosis, brucellosis, scabies, lice, the ox warble, liver flukes and some internal parasites in cattle; foot-and-mouth disease, hog cholera, atrophic rhinitis, eperythrozoonosis (an anaplasmosis-like disease), scabies, lice and internal parasites in swine; glanders, dourine, scabies and internal parasites in horses; foot-and-mouth disease, foot rot, ulcerative dermatosis, sheep pox, scabies, liver flukes, some stomach and intestinal parasites in sheep.

We must live with some diseases which cannot, with present knowledge, be eradicated but the losses from these diseases can be greatly reduced or prevented by good management and sanitary practices. Some of these are: anthrax, blackleg, malignant edema, bacillary icterohemoglobinuria (red water), tetanus (lockjaw), foot rot, mastitis, pneumonia, listerellosis, leptospirosis and certain forms of parasitism in cattle; erysipelas in swine and enterotoxemia in sheep.

All animals dying from unknown causes should be sent to a rendering plant for processing or buried in a pit about six feet deep, covered with quick lime and sufficient earth to fill the pit, or they should be **completely** burned. Complete incineration at the site of death is the preferred method of disposal of animals affected with anthrax and the one required in Montana. This method has been successfully used in Montana with the result that on known-infected ranches there have not been (to our knowledge) any recurrent outbreaks even though more than forty years have passed, in two instances, since losses from anthrax have been recorded.

Every effort should be made to dispose of carcasses, dead from spore-forming organisms, in a manner which will make certain that only a **minimum** number of spores will remain to permanently contaminate a range. Spore-forming organisms are those which survive almost indefinitely and are responsible for such diseases as anthrax, blackleg, malignant edema, tetanus, red water, welchii infections and erysipelas in swine.

Due to the marked demand for protection from devastating plagues, such as those with which we have only recently been confronted (foot-and-mouth disease, vesicular exanthema in swine, and rabies), it should be apparent to every citizen of Montana that the Livestock Sanitary Board must maintain a virile and competent livestock disease-control organization. Protection of public health is an extremely important phase of our work and to do it properly we must maintain well-equipped laboratories, staffed by trained personnel, as well as a properly trained field force. This protection of our people can only be accomplished by minimizing animal diseases transmissible to man (such as tuberculosis, brucellosis, trichinosis, erysipelas and anthrax), by maintaining our dairy industry on a high sanitary standard, by improving and enlarging the scope of meat inspection, and by making available more animal foods and food products through improved animal disease-control methods.

The value of livestock and poultry on farms in Montana on January 1, 1952, reported by the U. S. Department of Agriculture's Bureau of Agricultural Economics, was $507,647,000. This has been enhanced by natural increase and imports by about $200 million, making a total value of at least $700 million.

To adequately protect this great industry, it is essential that our field laboratory be put into active service and that additional professional personnel be secured. During the foot-and-mouth disease and vesicular exanthema outbreaks we fully realized how understaffed we were. However,

it was most gratifying to learn during these distressing times that even though we had a small organization it was made up of as loyal individuals as could be found anywhere on earth. As has been brought out many times in the past, the Livestock Sanitary Board, together with its personnel, is the most valuable insurance carried by the State of Montana. The premiums paid each year are more than offset by the work done and the Livestock Sanitary Board is always ready to do more than its share in protecting our very perishable $700 million industry against destructive diseases.

CHANGE OF REPORTING PERIOD

For a long time it has been the desire of the executive officers to change the reporting period (December 1 of one year through November 30 of the next) to coincide with the fiscal year (July 1 of one year through June 30 of the following year). Since it is impossible to prepare a report for a complete calendar year, have it printed, as required by law, and in the hands of the Governor by January 1, it was decided that this change should be put into effect this year. Attorney General Arnold H. Olsen and Governor John W. Bonner were asked for their opinions as to whether or not this change would be legal and acceptable. The following letters are self explanatory:

"H. F. Wilkins, D.V.M.
State Veterinary Surgeon
Livestock Sanitary Board
Helena, Montana

"Dear Doctor Wilkins:

You advise that the Montana Livestock Sanitary Board has approved the change of its working year to coincide with the fiscal year —from July 1st of one year to June 30th of the following year. You have asked my opinion as to whether this action of the Board is sufficient to make this change. I have been unable to find any provision in the law that prohibits the Livestock Sanitary Board from establishing a working year in this manner.

Section 46-242. Revised Codes of Montana, 1947, provides that the Veterinary Surgeon shall on or before the thirty-first day of December of each year make a written report to the Livestock Sanitary Board, which report must be transmitted by them to the Governor. This Section does not specify what period must be covered by the report. Therefore, if it is agreeable with the Governor I cannot see any objection to having a report run from July of one year to July of the next year. In legislative years the Governor may desire a supplemental report bringing the report up to the end of the year. However, this is a matter for the Governor to decide. Therefore, it is my opinion that the Livestock Sanitary Board may change its working year from the calendar year to the fiscal year.

Very truly yours,
ARNOLD H. OLSEN
Attorney General"
February 27, 1952

"Dr. H. F. Wilkins
State Veterinary Surgeon
State Livestock Sanitary Board
Helena, Montana

"Dear Dr. Wilkins

I have your letter of February 26, requesting permission to change the time on which your Department submits its annual report to this office to conform with your fiscal year.

Be assured I have no objection to such change.

Sincerely yours,
JOHN W. BONNER,
Governor"

In the future the Board may prepare a short report for the Governor, other state officials and Board members, each odd year and a detailed printed report each even year covering the biennium.

The present report will consist of information contained in the mimeographed report for the period ending November 30, 1951, and information covering the period from December 1, 1951, through June 30, 1952.

FINANCES

The cost of conducting the affairs of the Livestock Sanitary Board during the past year has not been as much as had been anticipated, partly due to the inability to secure the services of such additional help as was planned. The department is very much in need of additional administrative assistants and while every effort has been made to secure this much-needed personnel, salaries for such work are in no way comparable to those offered by industries or to what can be made in private practice. This lack of additional help has been keenly felt. However, this has been compensated for in part by much overtime work by the present personnel. Had it not been for an unselfish sense of responsibility and keen interest in our work by our field personnel, we could not have accomplished what we have in the control of brucellosis, tuberculosis, bacillary icterohemogobinuria (red water), leptospirosis and anaplasmosis, in the prevention of foot-and-mouth disease and in the eradication of rabies, improvement in meat and dairy inspection and the various other tasks assigned to the Livestock Sanitary Board.

Since there is such a strong move nationally to control and eradicate brucellosis, it seems quite imperative that Montana go along with the National program and do its part toward hastening the eradication of this disease from the United States. It is brought out under the heading of BRUCELLOSIS in this report that Montana is contributing a very small sum toward this program as compared with many other states. Because of probable future requirements for the shipping of Montana feeder cattle and because of the public health aspect with regard to brucellosis, the Livestock Sanitary Board feels obliged to ask the legislature for an increased appropriation for brucellosis eradication.

Since meat inspection is primarily and essentially a public health work, it is felt that a large part of the expense of this program should be paid for out of public funds and not entirely by the meat industry as is now being done in Montana. An additional appropriation for carrying out a more comprehensive system of meat inspection may be requested.

Even with the additional cost associated with the prevention of the introduction of foot-and-mouth disease, and of the other new disease problems with which we are, or may be, faced—such as vesicular exanthema in swine, listerellosis, leptospirosis and anaplasmosis, every effort has been made to live within our present appropriation as has been the policy of this department for over thirty-five years.

Every effort has been made and will continue to be made to hold down the cost of operation but materials used in the laboratories and in the field have increased approximately sixty per cent, so regardless of our efforts to economize our expenses are proportionately higher.

As has been pointed out on a number of previous occasions, money appropriated to the Livestock Sanitary Board, for its public health work and for the protection of livestock against animal diseases, has been indispensable to the stability of our entire economy and the health of our people. Most everyone now fully realizes the tremendous impact an outbreak of foot-and-mouth disease or other animal plague would have upon this livestock-producing state. Had an outbreak occurred, the Livestock Sanitary Board might have been able to withstand the impact had the disease been recognized at once and immediately eradicated. However, if the disease had become widespread, sufficient additional funds could only have been made available by a special session of the legislature, which would have been very costly. At the last session of the legislature, the Livestock Sanitary Board recommended that provision be made for an emergency fund of

a million dollars to be immediately available for use in the eradication of any devastating animal plague which might strike our state.

With the present threat of an extension of the recent outbreaks of vesicular exanthema, with anthrax and rabies rampant in many sections of the United States, and with foot-and-mouth diesase widely distributed in most countries of the world, the Livestock Sanitary Board is fully aware of the threat of invasion by any one, or all, of these plagues and of the need for adequate financing at all times to meet any emergency.

DUTIES OF FIELD PERSONNEL

In order to carry out the provisions of the law creating the Livestock Sanitary Board and the rules and regulations issued under the law for the control and eradication of disease, and for the carrying out of sanitary inspection of dairies, milk plants, slaughterhouses, rendering plants and saleyards, Montana has been divided into ten districts with a district deputy State veterinary surgeon in charge of each district. Under Regulation 43, the duties of district deputy State veterinary surgeons are set forth as follows: "District deputy State veterinary surgeons, without further instruction from the Montana Livestock Sanitary Board, shall investigate immediately all reports of an infectious, contagious or dangerous disease and shall make such inspections, tests, and investigations in their respective districts as shall be deemed necessary for the control of dangerous diseases of livestock and poultry, and for the proper inspection and scoring of dairies and slaughterhouses. They shall also supervise the sanitary conditions at public stockyards and shall take such action as they consider necessary for the proper observation and compliance with orders and regulations issued by the Montana Livestock Sanitary Board."

In addition to these duties, they are expected to work with the resident deputies or other veterinarians in their district, together with sanitary inspectors. Some of the districts are very large and cannot be properly covered by the district deputy so some of these districts are partially divided and some of the work assigned to the resident deputy, who not only reports to the Helena office, but also to the district deputy so that he will at all times be informed as to what work is being carried on in his district.

Junior district deputy State veterinary surgeons are those who have been subsidized in a small way to assist the district deputy in carrying out the work in that particular district.

The Milk Sanitarian for the Livestock Sanitary Board is responsible for state-wide supervision of all dairy inspection work performed by our district deputies. Dr. J. D. C. Wipf personally takes care of most of the milk plant inspections and has the task of checking and sealing the new short-time pasteurizers. Dairy and milk plant inspection work has increased to such an extent that additional supervisory help will undoubtedly be necessary at some time in the future.

Meat inspectors are those who are in charge of meat inspection in the various towns or counties.

Lay inspectors are those who have been particularly trained to be helpful and of assistance to district deputies or other veterinarians. These men have been found to be extremely efficient in assisting with the control and eradication of foot rot in sheep, in conducting meat inspection under veterinary supervision and livestock inspections at saleyards, including bleeding of cattle which may go back to the country or the vaccination of calves against brucellosis and also in making dairy inspections.

The duties and responsibilities of resident deputy State veterinary surgeons are set forth under Regulation 43 as follows: "Resident deputy State veterinary surgeons shall report immediately all cases of infectious, contagious or dangerous diseases of livestock or poultry to the State Veterinary Surgeon at Helena. If the disease is of a serious nature and the resident deputy cannot secure the immediate service of a district deputy State veterinary surgeon, then the resident deputy shall make an immediate investigation without awaiting orders from the State Veterinary Surgeon. Where the disease reported is not of a serious or dangerous character requiring immediate action, then the resident deputy shall report the condition to the State Veterinary Surgeon and await instructions."

In accepting a deputyship, a veterinarian assumes a distinct responsibility to the livestock industry of Montana and to the Montana Livestock Sanitary Board, to carry out all rules and regulations of the Board and to conduct their inspections and tests of livestock and poultry for interstate shipment strictly in accordance with the requirements of the state of destination.

MONTANA LIVESTOCK SANITARY BOARD

I wish to express to the Montana Livestock Sanitary Board members my personal appreciation for the kind consideration and the many courtesies extended to me. To every member of the Livestock Sanitary Board corps I express appreciation for the advice and consideration extended to them by the members of the Board.

Again I wish to call to the attention of the stockmen of Montana that the Board members serve without compensation for their time and that some of them have never charged a cent for expense incurred in attending Board meetings. Our members have given freely of their time and talents to be of assistance to the Executive Officer and the livestock men of Montana.

HONORABLE STATE BOARD OF EXAMINERS

The Montana Livestock Sanitary Board and its corps appreciate the consideration and many courtesies which the State Board of Examiners has extended to us.

COOPERATING AGENCIES

We deeply appreciate the cooperation and assistance given us by the U. S. Bureau of Animal Industry, and we are particularly grateful to Dr. G. W. Cronen, Inspector in Charge, for his good counsel, cooperation and assistance. To his fieldmen we extend our sincere thanks for their help in our disease-control programs and for making possible the success attained in brucellosis control.

We express to the State Board of Health, to the Secretary, Dr. G. D. Carlyle Thompson, to their laboratory personnel, their cooperating sanitary officials and all county and local health departments, our appreciation for the excellent assistance given us in matters of vital importance to animal and human health.

The Montana Stockgrowers Association and the Montana Woolgrowers Association have been of great assistance in many important matters of interest to our stockmen and to the people of Montana. To both of these organizations we express sincere appreciation for their help.

We appreciate the cooperation and assistance given us by the Dairy Division of the State Department of Agriculture, the Milk Control Board and its secretary, Mr. A. A. Klemme, and our milk distributors and dairymen, in making possible an adequate and safe milk supply for our people in Montana.

We thank the saleyard operators for their assistance in furthering the brucellosis-control program and for their counsel and effort to bring about better operating practices in public saleyards.

To the Montana Poultry Improvement Board, its secretary, and all poultrymen in the State, we express our thanks for their cooperation in making possible better poultry disease-control practices.

We also thank Dr. R. B. Tootell, Head of the Extension Service, and all county agents for the splendid manner in which they have cooperated in our brucellosis-control program and all other cooperative programs of concern to the general public. Their assistance in disseminating information, arranging and conducting meetings of farmers and stockmen, has been of great value.

Because of the excellent cooperation and assistance of all these various agencies, our burden has been lightened and the efficacy of our efforts has been vastly increased.

MONTHLY LETTER

Our monthly letter is still being sent to all veterinarians in the State and to the members of the Livestock Sanitary Board. Through this letter we are able to inform the veterinarians in Montana of the appearance of new diseases or those which may be a threat to the State, so that they may be on the alert for these diseases. In this way they are kept conversant with the work we are doing and are informed of the various disease-control and other problems of which the veterinarians of Montana should be aware.

ANTHRAX

There were no cases of anthrax diagnosed in Montana in the period from December 1, 1950, through June 30, 1952.

During the early spring and summer of 1952, extensive losses were reported from anthrax, principally in swine herds (which is unusual) in a number of eastern and central states. Intensive investigations have determined that this has been attributed primarily to the feeding of imported unsterilized bonemeal.

Every effort has been made to handle the few anthrax outbreaks in Montana so as to minimize range or premise contamination with anthrax spores which are known to survive in soil for many years. This has been accomplished by the complete burning of all carcasses where they lay or moving them in such a manner as not to spread the infection. In addition, as much contaminated material as possible was burned or buried with lye and lime.

BACILLARY ICTEROHEMOGLOBINURIA
(Red Water)

In the period from December 1, 1950, through November 30, 1951, 9,477 cattle were officially vaccinated against bacillary icterohemoglobinuria and 21 cases of the disease diagnosed. In the period from December 1, 1951, through June 30, 1952, there were 6,377 cattle vaccinated and 20 cases of the disease diagnosed. For a summary and outline of the disease we refer you to our previous reports.

During the preceding nineteen months there were 1,028 blood samples tested, by means of an agglutination test, of which 805 were negative, 90 positive and 133 suspicious.

It is hoped that through the combined efforts of the Montana Veterinary Research Laboratory and the Montana Livestock Sanitary Board a means will soon be evolved to detect carrier animals so that further spread of the disease can be prevented and a more satisfactory vaccine, effecting a more lasting immunity, can be produced.

BRUCELLOSIS

Brucellosis has been designated by the U. S. Bureau of Animal Industry and all states as "Livestock Enemy Number 1," and it is an accepted fact that **BRUCELLOSIS MUST GO!**

With our present knowledge of this disease we know it can be speedily eradicated if we have proper cooperation from our livestock people and sufficient money to carry the program through to a successful conclusion. Most states are contributing generously toward this eradication program. In checking a few it is noted that Alabama has made available $90,000 a year. Wisconsin $1,924,940, North Dakota $100,000, Idaho $55,000, California $400,000 and Montana only $10,000.

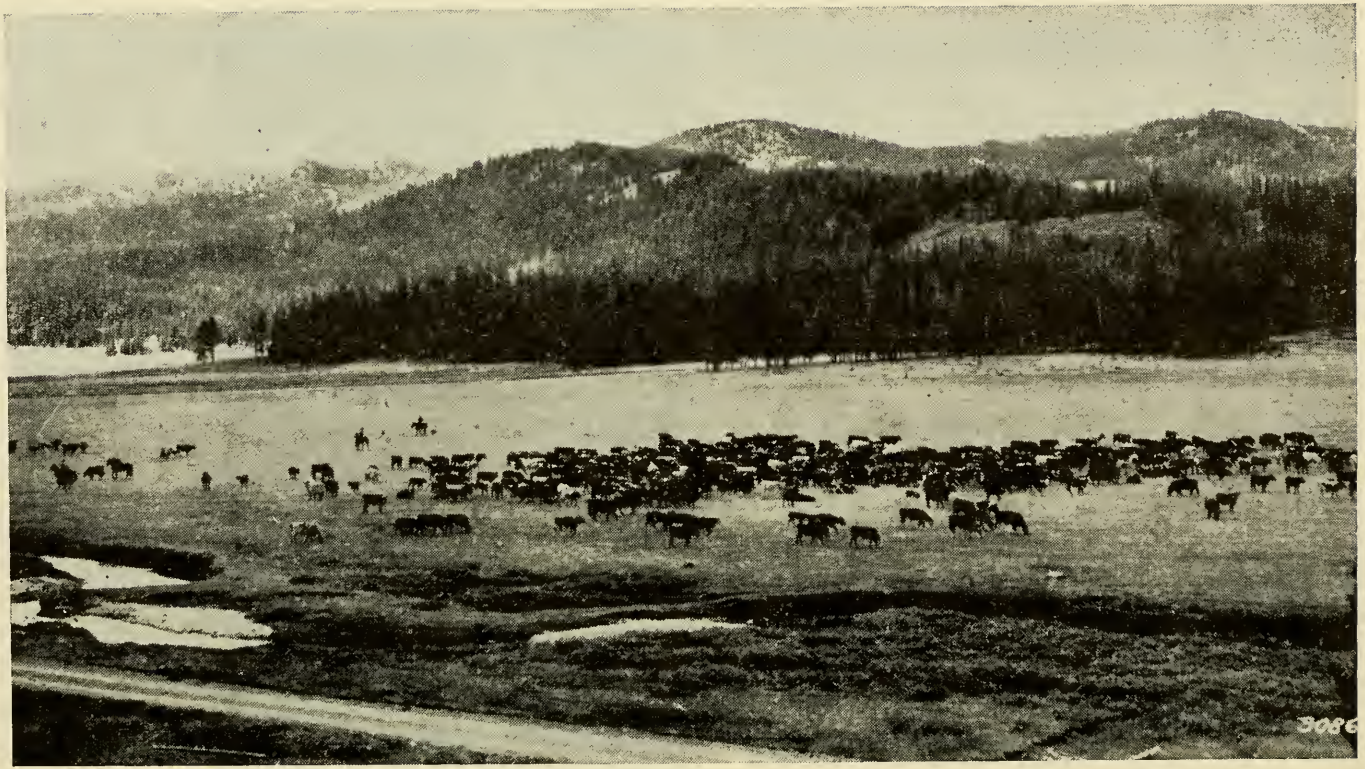
In Montana most of the expense for vaccination of heifers is borne by the livestock man, and I believe this is as it should be, since the cost is small and the benefits accrue principally to him; but testing and other phases of eradication must be paid for by the State and Federal Government if a campaign for eradication is to succeed. Because of the need for this program, a request for a marked increase in the Livestock Sanitary Board appropriation for this work will be made for the coming biennium.

From December 1, 1950, through November 30, 1951, a total of 68,571 cattle were tested for brucellosis. The Laboratory tested 47,988 blood samples submitted by Federal and State veterinarians and 20,533 blood samples were tested in the field by deputy State veterinarians. Of the cattle tested 62,802 were negative, 2,836 gave a positive reaction and 2,933 gave a suspicious reaction.

A HERD OF SEMIRANGE CATTLE

By testing all breeding cattle in the fall at roundup time and disposing of all positive and suspicious reactors, most range herds can be freed of brucellosis with one test. Such herds will usually remain clean if only young vaccinated replacements are made and all heifers vaccinated each year.

Brucellosis is rarely contracted on the range during the summer months because well-managed herds are "calved-out" before they are moved to summer range, and also because of the distribution of cattle on the range.



ROUNDING UP CATTLE FOR BRUCELLOSIS TEST AND FALL VACCINATION

With good facilities and a good working crew, it is not too difficult to test 500 head of range cows in a day. Every range and semirange operator should know whether or not he has brucellosis in his herd.

During the 7-month period from December 1, 1951, through June 30, 1952, a total of 44,314 cattle were tested for brucellosis. The Laboratory tested 29,700 blood samples submitted by Federal and State veterinarians and 14,614 blood samples were tested in the field by deputy State veterinarians. Of the cattle tested 40,621 were negative, 2,116 gave a positive reaction and 1,577 gave a suspicious reaction.

From December 1, 1950, through November 30, 1951, a total of 2,902 dairy cattle were tested for sale at saleyards and for local auction sales. Of this number 2,735 were negative, 78 gave a positive reaction and 89 gave a suspicious reaction. Eight of the 78 reactors and 27 of the 89 suspects were recorded as having been vaccinated.

During the 7-month period from December 1, 1951, through June 30, 1952, a total of 1,056 dairy cattle were tested for sale at saleyards and for local auction sales. Of this number 28 gave a positive reaction and 60 gave a suspicious reaction. Five of the 28 reactors and 46 of the 60 suspects were recorded as having been vaccinated.

A total of 70,827 calves were officially vaccinated by Federal and State veterinarians from December 1, 1950, through November 30, 1951, and a total of 87,283 were officially vaccinated from December 1, 1951, through June 30, 1952.

In the control of brucellosis it is well to remember that animals other than cattle (horses, swine, and goats) may become infected and be sources of infection. We know that horses may be carriers of bovine brucellosis. Research has demonstrated that many horses affected with fistulous withers or poll evil are affected with brucellosis and that a number of outbreaks have been traced to the introduction of **Brucella**-infected horses. Since swine are very susceptible to brucellosis, the disease occurs throughout the United States wherever hogs are raised, but it is most common in the corn-hog-belt states of the Middle West.

From December 1, 1950, through November 30, 1951, 9 swine, 41 goats and 3 horses were tested for brucellosis. The swine and goats were negative, but all 3 horses were positive.

From December 1, 1951, through June 30, 1952, 23 swine, 40 goats and 2 horses were tested for brucellosis, with negative results except for one positive horse.

As finances and personnel permit, the Montana Livestock Sanitary Board will inaugurate a brucellosis-control-and-eradication program in any area established in accordance with the provisions outlined in Title 46, Section 212, Revised Codes of Montana, 1947. Such an area may be established upon receipt of a petition signed by not less than 75% of the livestock owners of the species of animals to be tested or vaccinated, and representing not less than 50% of such species in any township. When 75% or more of the townships in any county in Montana are established by the Montana Livestock Sanitary Board as a disease-control area, it becomes mandatory on the part of the remaining livestock owners in such county to submit their livestock for test or vaccination, as directed by the Montana Livestock Sanitary Board.

Lake County was declared a brucellosis-control area on October 1, 1950. The general vaccination of all heifers and the testing of all herds is being carried on by Federal and State veterinarians; however, progress has been slow due to a shortage of personnel. It is anticipated that the testing of all herds will be completed by January 1, 1953, and the county qualified for certification as a modified certified brucellosis-free area. Petitions for additional control areas are now being circulated in other counties.

CALF DIPHTHERIA

Calf diphtheria has been observed in 233 calves and cattle during the period from December 1, 1950, through June 30, 1952. This condition, in the form of necrotic laryngitis, stomatitis or deep necrotic ulcers, has been observed for many years in bucket-fed calves and occasionally in nursing range calves, yearlings and purebred cattle (especially bulls). Calf diphtheria is caused by **Spherophorus necrophorus** (ordinarily a secondary invader) an organism responsible for many disease conditions in livestock. When the disease is recognized early and proper treatment administered, recovery is usually prompt.

CANCER EYE

(Epithelioma of the Eyes of Cattle)

Cancer eye is a common condition found in cattle, particularly in those areas where the Hereford breed predominates. The incidence of this disease is increasing. During the period from December 1, 1950, through June 30, 1952, there were 955 cases reported by inspectors at public saleyards. Such animals must be consigned to quarantine pens and sold as diseased animals to packing houses where Federal, state or municipal inspection is maintained. Cows showing extensive eye involvement with secondary glandular metastasis or general debility due to the condition, are condemned as unfit for human consumption.

It is recommended that every effort be made to recognize this condition early so that the animal may be sold for slaughter before the disease condition has advanced to such a stage as to warrant condemnation of the carcass. Cattle with extensive foul-smelling cancer eyes with swelling and degeneration of the eye socket, should not be brought to saleyards, but destroyed or sold to a rendering plant.

The offspring of cancer-eye cows should be sold for slaughter and **not retained for breeding purposes,** as it has been demonstrated that a high percentage of such animals will develop the disease and continue to perpetuate and increase the incidence of the condition. **Bull calves from cancer-eye cows should be castrated.** It has been demonstrated that these procedures, if carried out over a period of years, will materially reduce the incidence of cancer eye. All purchasers of purebred Hereford cattle should refuse to buy any cattle with cancer eye or offspring from parents with this disease.

FOOT-AND-MOUTH DISEASE

The foot-and-mouth disease outbreak which first appeared near McLean on the Leonard Waas Ranch in Saskatchewan, Canada, in late November or early December 1951, was not positively diagnosed and reported to the world until February 25, 1952. This delayed diagnosis was occasioned by the mildness of the disease, and the fact that the diseased animals promptly recovered as with vesicular stomatitis. Veterinarians were also confident that foot-and-mouth disease could not occur in such a protected province, which was shielded from known-infected countries by the Polar Region on the north, by the United States on the south, which was free of foot-and-mouth disease, and on the east and west by thousands of miles of rugged terrain and the oceans. It just could not be, but it WAS!! In addition the Province is essentially a wheat-producing one with a relatively small livestock population. The moral of the issue is: foot-and-mouth disease can and may occur **anywhere, any time,** and no veterinarian or livestock owner should ever take a chance in making a mistaken diagnosis. All suspected cases of foot-and-mouth disease should be reported immediately to the nearest veterinarian, county agent, sheriff, State Veterinarian at Helena or the Bureau of Animal Industry, U. S. Department of Agriculture.

The cost of this outbreak to the Montana Livestock Sanitary Board was considerable, but much less than was anticipated, or what it might have been, had not knowledge previously gained been used to advantage. Immediately upon learning of the outbreak at 11:45 A. M., February 25, when the Executive Officer was in Billings, the following actions were taken:

(a) Veterinarians in charge of saleyard inspections and all key veterinarians were alerted by phone and given instructions.

(b) A conference of a few stockmen and veterinarians was called at 1 P. M. to consider the various aspects of the outbreak and to formulate a fitting plan of action.

(c) Orders and lists of all known Canadian imports of livestock were sent the proper veterinarian with instructions to immediately locate, inpect, and quarantine such animals. This order covered all susceptible animals imported since October 24, 1951, and all others which might have come into Montana.

(d) Measures were taken immediately to send out detailed information about foot-and-mouth disease and similar diseases to all veterinarians,

county agents, sheriffs and livestock owners, together with instructions giving the steps that must be taken in all instances should any suspected cases of foot-and-mouth disease be reported.

One investigation revealed that a truck shipment of 22 cattle had been brought in from the quarantined area and not far removed from an infected premise about two weeks previous to the diagnosis. No record of importation had been received in either this or the Bureau of Animal Industry office, due to entry through another state, but was located through the vigilance and alacrity of the local veterinarian. Fortunately the cattle were transported in a Montana truck, were unloaded, retained and fed in a corral as a unit up to the time o f the first inspection. Here they were quarantined.

(e) All veterinarians were instructed to immediately investigate all cases of suspected foot-and-mouth disease and, of course, all animals at saleyards were carefully checked before each sale. This resulted in their making 433 investigations wherein 117,479 animals were observed.

(f) The following proclamation was issued by the Honorable John W. Bonner, Governor of Montana:

BY THE GOVERNOR: A PROCLAMATION

WHEREAS the livestock industry is one of the basic industries of Montana and substantially contributes to its economy and welfare; and

WHEREAS every means must be taken to promote the livestock industry in Montana and every means must be taken to protect it; and

WHEREAS foot and mouth disease among livestock causes great loss and therefore could jeopardize the economy of the State of Montana; and

WHEREAS the Governor of Montana has good reason to believe that a disease dangerous or inimical to the livestock of Montana, to-wit: foot and mouth disease has become epidemic in the Dominion of Canada, particularly in the Territory of the Dominion of Canada bordering on Montana and more particularly in the Province of Saskatchewan, Canada; and

WHEREAS Montana livestock is not now in any manner afflicted with said foot and mouth disease but the said disease in Canada now presents a grave threat to the livestock industry in Montana even though Canadian officials are doing everything to stamp it out and prevent its expansion; and

WHEREAS it is common knowledge that livestock, other animals of all description, articles and commodities are continually transported from Canada to the United States and particularly transported from Canada to the State of Montana; and which livestock, animals, articles and commodities are likely to convey such foot and mouth disease to the livestock located within the State of Montana; now

THEREFORE I, JOHN W. BONNER, the duly elected and qualified GOVERNOR OF THE STATE OF MONTANA, under and by virtue of the laws of the State of Montana do hereby immediately prohibit the importation from the Dominion of Canada and its Provinces any and all livestock, animals of all descriptions, articles and commodities likely to convey such foot and mouth disease to livestock located within the State of Montana.

In the execution of this Proclamation order and prohibition, it is contemplated by the Governor of Montana that all public officials including the Livestock Sanitary Board of Montana and the State Veterinarian shall use every means to place this Proclamation and its terms into effect without delay.

The Governor of the State of Montana especially invites all persons and corporations in the State of Montana, including farmers, livestock men, saleyards operators, transportation agencies, livestock dealers, livestock commission agencies, Federal officials and agencies and anyone else having to do with the livestock industry and its preservation to cooperate and aid in carrying out the terms and intent of this Proclamation and to assist in pre-

venting an outbreak of foot and mouth disease among the livestock situated in the State of Montana.

IN WITNESS WHEREOF, I have hereunto set my hand, and caused the Great Seal of the State to be affixed. DONE at the City of Helena, the Capitol, this the 3rd day of March, in the year of our Lord, one thousand nine hundred and fifty-two.

Signed: JOHN W. BONNER

By the Governor:

(SEAL)

Signed: Sam W. Mitchell

Attest: Secretary of State

An advanced case of foot-and-mouth disease showing excessive salivation and erosion of the mucous membrance of the swollen tongue.

Investigations by the Bureau of Animal Industry, U. S. Department of Agriculture in Washington, revealed that many cattle and much meat had been shipped from Saskatchewan to several states, some as far south as New Mexico and east to New York. Had roads been open and the winter mild, foot-and-mouth disease could easily have been spread throughout the United States from this source before it was diagnosed. Had a similiar outbreak occurred anywhere in the United States one can easily visualize how widespread the infection might have become. Regulatory officials should have learned a valuable lesson from this outbreak. It again emphasizes the need for early recognition of the disease and the fact that with one exception, other outbreaks in this country have existed for weeks before they were finally diagnosed. With all of these handicaps, every outbreak was successfully eradicated. Foot-and-mouth disease, unlike those diseases produced by spore-forming bacteria, once it is eradicated, is no longer with us until it has been re-introduced. Foot-and-mouth and similiar diseases should always be eradicated regardless of the immediate cost because the cost of living with it, would far exceed the cost of eradication.

Every effort was made to prevent hysteria and still carry out an effective and sane preventive program. Federal custom and immigration officials were contacted to enlist their cooperation in carrying out the provisions of the Governor's Proclamation. Planes were dispatched to patrol the Border and determine the danger of animals migrating south and any probable violations. However, it was learned from the pilots when flights could be made, that practically all roads were blocked with snow and that livestock on both sides of the Border, were confined to small feeding areas near the homes of the owners. Flying was extremely hazardous and sometimes impossible due to storms and low-hanging clouds or fog.

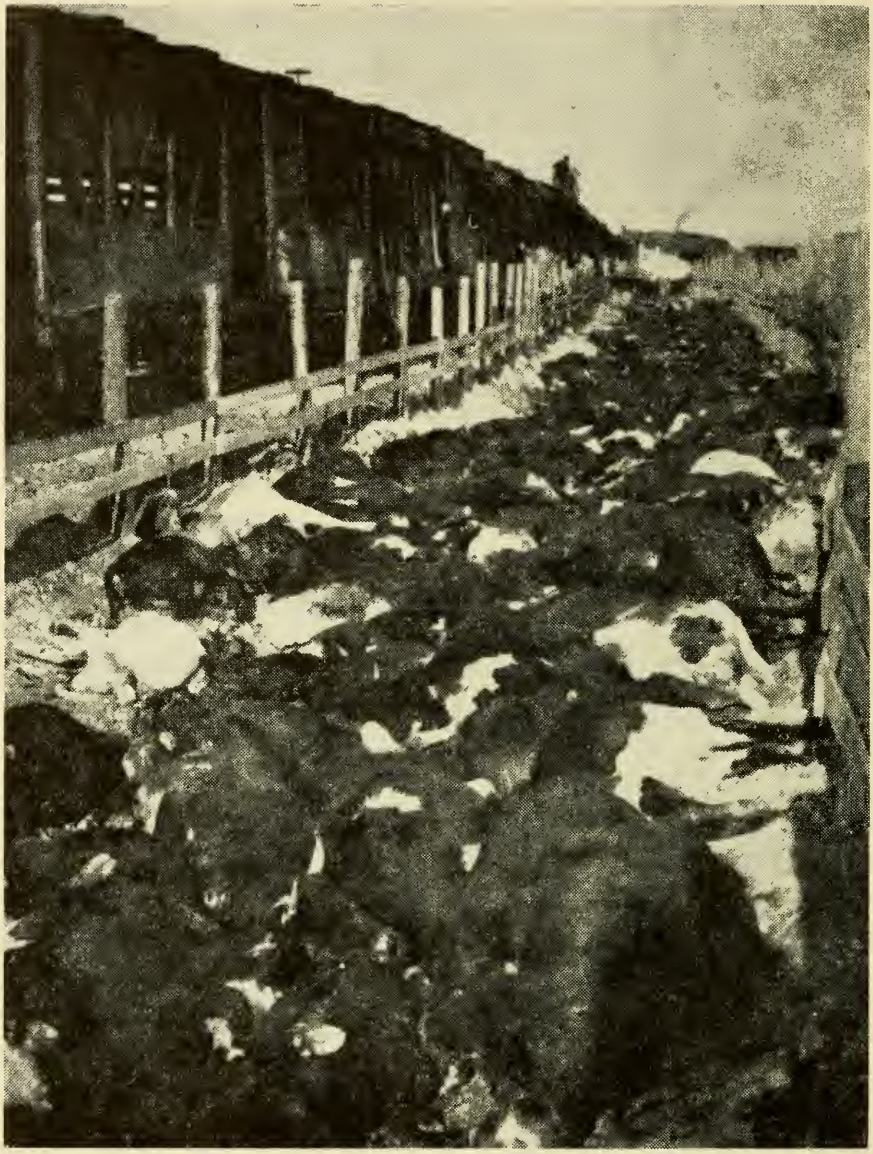
Because of the intense cold and snow-blocked roads, disinfection stations were not established at Montana-Canadian ports of entry. The cost of setting up such stations under prevailing conditions would have been exhorbitant and the probability of keeping out foot-and-mouth disease by the installation and use of these stations, was considered by all authorities consulted, to be practically useless. Disinfecting stations ordinarily are of little or no value other than when set up around known-infected premises or areas. Because of strict quarantines and all other precautionary measures they can be of little value other than psychologically under certain conditions. It was estimated that construction and operation of the stations would have cost approximately $200,000. Such an expenditure or even more would have been justified if it had been thought or known any protection was to be afforded our State therefrom, because loss to the livestock industry and the State would not have been less than $50 million if foot-and-mouth disease had been introduced.

All states were very cooperative and we greatly appreciate the confidence placed in Montana's Livestock Sanitary Board organization. Not a single one issued an embargo against Montana even though foot-and-mouth disease was on two occasions, only fifty miles from our border.

Appreciation is extended to the Honorable John W. Bonner, Governor of Montana, for his help, confidence and encouragement when we really needed it, to the State Highway Patrol which was particularly helpful in checking the movement of livestock, the State Highway engineering staff, State Fish & Game Commission, Montana Extension Service, the Department of Agriculture, U. S. Fish & Wildlife Service, Montana sheriffs, Montana Stockgrowers and Woolgrowers associations, Montana newspapers and reporters, radio announcers, our livestock organizations, the people, and last but not least—the loyal support given by all Montana veterinarians and the Bureau of Animal Industry, U. S. Department of Agriculture.

As of July 1, 1952, the Canadian situation looks bright and there is a good chance that the disease may have been eradicated.

In Mexico the disease has not appeared for about a year and it has been announced that the Border will be open September 1 if no new outbreaks occur.



IT CAN HAPPEN HERE—This is not Saskatchewan, it is Montana. The picture was taken at Glendive during the nation-wide epidemic of foot-and-mouth disease in 1914, which cost the country $9,000,000 directly and untold millions more in disruption of trade. Three Montana counties were infected, and 1,667 animals worth $67,603 were slaughtered and buried. The outbreak, which started from animals shipped out of the infected Chicago stockyards, lasted from November of 1914 through January of 1915. Twenty-one other states and the District of Columbia were affected.

Foot-and-mouth disease has been worse throughout the world this year than it has for a decade. England has had one of its most serious outbreaks in many years. This is also true of Europe and other countries. For this reason the sanitary officials of this country have been deeply concerned and fearful that present defense might not be adequate.

It is difficult to understand how foot-and-mouth disease has been kept out of the United States for so many years with the disease so widespread throughout the world.

Too much credit cannot be given the Bureau of Animal Industry, U. S. Department of Agriculture, for the excellent preventive measures prescribed and with the manner in which they have been carried out even with inadequate help and finances.

Extensive research is needed to learn more about foot-and-mouth disease and other vesicular diseases and how to more effectively prevent antd eradicate these diseases when they do appear. Even with our present limited knowledge and from experience gained in Mexico, it has been demonstrated that foot-and-mouth disease can be eradicated from any country in the world, for what was done in Mexico, can be done anywhere. Inimical and deterring conditions and factors could not have been worse.

Our country has millions to assist other countries in setting up disease-control centers, but very little money for an intensive study of our own disease problems, or those of foreign countries, with which we may be faced in years to come. We should insist on more research at home—NATIONAL, REGIONAL and STATE!

INFECTIOUS KERATITIS

Infectious keratitis has been observed and reported in 1,120 head of cattle during the period from December 1, 1950, through June 30, 1952. It has also been reported by numerous owners in almost every section of the State at all seasons of the year. Formerly it has been observed only during the late summer and fall, and no doubt its appearance at all seasons of the year is due to the increased exchange of cattle. Severe loss of condition makes infectious keratitis one of our very costly livestock diseases.

When promptly and properly treated, animals usually make a quick and satisfactory recovery but there is no known preventive which is really satisfactory. There are numerous preparations on the market today for the treatment of this condition and when used early and as recommended, give good results. It has also been found that if affected cattle can be protected against bright sunlight by confining them in a shed during the day and turning out at night to feed, recovery is materially hastened.

JOHNE'S DISEASE

Johne's disease affecting both cattle and sheep, is caused by an acid-fast organism similar to the one causing tuberculosis. The infection involves and causes pathological changes in the intestines. Development of the disease is ordinarily very slow and years may go by before an infected animal shows clinical manifestations which consist principally of a persistent diarrhea and gradual loss of flesh.

Treatment of infected animals up to this time has not been satisfactory and elimination of the disease from herds, by test, is tedious and exacting, usually requiring a year or more before all carrier animals can be detected and removed.

All cattle, particularly those in purebred herds, showing a persistent diarrhea extending over a period of weeks, should be carefully examined by a veterinarian. If Johne's disease is diagnosed, then a program for its control and eradication from the herd should be inaugurated.

During the past nineteen months, 21 cases of Johne's disease were diagnosed in two herds and it is believed that the disease may exist in other herds in the State. All veterinarians are required to report suspected cases and to conduct tests for the detection of reactor animals.

LEPTOSPIROSIS

In 1951 there were three clinical cases of leptospirosis diagnosed and of 71 cattle on one ranch, 53 head gave a positive reaction to a serological test for this disease. There were no cases of this disease reported in the period from December 1, 1951, through June 30, 1952.

Leptospirosis is of great concern in several states at this time and will become of importance to us in the near future, unless means for its control and eradication can be perfected. Infected herds must be quarantined and no animals will be permitted to be sold except for slaughter until they have passed two negative tests, at least sixty days apart, and are held on clean ground between tests.

LOCO

There have been many cases of locoweed poisoning reported during 1951. The reappearance of this plant on ranges has no doubt been due to the unusually high precipitation during the past ten years.

Stockmen should use every precaution in grazing livestock on land where there is a heavy locoweed growth, since no satisfactory method of treatment is known. Land on which this plant is plentiful should never be grazed until there is an abundance of green grass. Locoweed is habit-forming so it is not advisable to graze animals previously locoed on ranges where many of these plants are growing.

Animals should be carefully watched for symptoms of locoweed poisoning, and if the weeds appear, the animals should be immediately moved to new and preferably green pastures. Treatment has not been successful since the damage to the central nervous system is apparently permanent.

MALIGNANT CATARRH

During the year 1951 we had five cases of malignant catarrh diagnosed and one case was reported for the period from December 1, 1951, through June 30, 1952.

MASTITIS

Mastitis continues to be a serious disease of dairy cattle and is by far the most costly of all the disease conditions affecting dairy cattle. It has been demonstrated that this disease can, in a large measure, be prevented by proper management; and unless herds are properly managed, regardless of the efficacy of treatments used, the disease will continue to spread. Experience gained during two summers' work in the control of this disease has been reported in the 1949-50 annual report. The following recommendations have been found most useful in controlling mastitis:

MASTITIS CONTROL

by

DON MARBLE

Good management is the most important factor in keeping cows free from infection and in keeping infection at a low level in those herds where the disease has been introduced.

Many dairymen feel that certain families of cows are especially resistant to udder infections. It is well to keep the offspring of those cows which have produced a satisfactory amount of milk over many lactation periods. While mastitis infection is not passed from dam to calf, a tendency for broken, pendulous udders is inherited and such udders are especially apt to be injured.

Be quiet around the barn as an excited cow cannot give down her milk properly, and she is more apt to be injured or to injure others.

The following points will assist in the control of udder infection:

Be sure your milking equipment is clean and sanitary before you start milking.

Always milk infected cows last. Milk heifers and non-infected cows first.

Wash and dry the cow's udder and teats thoroughly paying particular attention to the end of the teat near the teat opening. If you are having mastitis trouble use individual wash cloths for your cows.

A chlorine solution (200 parts per million) or other good antiseptic should be used in the washing solution.

Be sure the pulsations on the milker and the line vacuum are adjusted to that recommended by the manufacturer of your machine.

Use rapid milking procedures. After the cow has been properly washed and stimulated the teat will fill with milk. This usually takes up to one minute, or about as soon as you can get the machine. Put the machine on when the teat is full. Remove the machine when the cow is milked (usually not over three minutes). When the machine is left on too long it will damage the tissues inside the teat and lower part of the udder, making a good place for bacterial infection to begin.

Milk is a good medium for bacterial growth. Usually after milking, a drop remains on the end of the teat—a very vital spot where bacteria can enter the teat. A cloth dampened with chlorine solution or other disinfectant and a few seconds' work can remove this hazard.

Eliminate high door sills, logs, and projections from barn or feed racks where cows may injure the udder.

Supplemental laboratory facilities are provided in the form of a traveling laboratory for the conducting of Brucella abortus ring tests of milk samples for the detection of brucellosis in dairy herds, mastitis control, various analyses of milk samples, pullorum testing and such other tests as may be conducted in a traveling field laboratory.

Wires and nails in boards are good sources for punctures, cuts and scratches which usually precede gangrenous mastitis. Do not allow them in your pasture, corral, loafing shed or barn.

Keep teat injuries clean by placing a gauze pack over an antiseptic. Bandage this in place with adhesive tape, and change at each milking.

To prevent mastitis in heifers, do not let calves suck each other. Sucking the immature udder will cause damage. If a calf has been drinking mastitis-infected milk, and sucks the udder of a young heifer the infection may be passed on to her.

Have ample room in your loafing shed to prevent cows from stepping on each other's teats and udders. Keep the loafing shed clean and well bedded. Avoid exposure to injury and cold.

Raise your own replacements. If replacements do have to be purchased, buy animals with sound udders and if possible, from a herd which is free from udder infections. Newly purchased cows should be isolated from the rest of the herd until examined by your veterinarian.

Clean and disinfect the platform under the cow frequently. Clean warm water containing one can of high-test lye in fifteen to twenty gallons of water is very good.

If hand milking is done, milk with dry hands, and do not milk diseased milk onto the floor.

Most important of all—isolate all cases of mastitis immediately. Milk these infected cows last and disinfect your hands after milking them. Call your local veterinarian for early treatment.

Do not use teat tubes or dilators unless the greatest surgical cleaniness is employed. It is best to leave these procedures to your veterinarian.

Do not use lime or superphosphate or other chemicals on the standing platform, where the cows may lie down. These chemicals are useful in the gutter and on the walk behind the cows.

Be sure that the cows do not stand in mud and filth at any time and especially if it is deep enough to contaminate the ends of the teats.

PNEUMONIA IN CATTLE

There were 2,908 cases of pneumonia (hemorrhagic septicemia, shipping fever, pasteurellosis) observed and reported during the year 1951. During the period from December 1, 1951, through June 30, 1952, there were 542 cases reported. Until late in October 1949, the disease was rarely seen and had caused little trouble in native Montana cattle, but since that time has appeared in almost every section of the State. It was most commonly seen in weaner calves which had been shipped through saleyards without having first been vaccinated or given a prophylactic dose of immune serum, but now it is appearing spontaneously in numerous herds and cattle of all ages under normal range conditions, and with apparently no provocation. In several instances native cattle have become infected and developed pneumonia after having been associated for a few days with newly-acquired animals. It is evident that all newly-purchased cattle, especially those purchased through saleyards or those showing signs of illness, **be isolated for two weeks or more before being added to an established herd.**

Cattlemen who have been making no outside additions for the last three or more years and carrying out good management procedures have seldom experienced this disease in their cattle.

Prevention consists in handling cattle so that their resistance will not be lowered, especially at weaning time. It is strongly recommended that all calves, particularly those on ranches on which pneumonia has previously occurred be vaccinated with hemorrhagic septicemia bacterin or pneumonia-mixed bacterin a week or so before weaning and re-vaccinated at weaning time. Calves, not previously vaccinated, and purchased through saleyards or otherwise exposed, depleted, etc., should be given a prophylactic dose of antiserum, and vaccinated with the bacterin in about two or three weeks. This disease now seems to be firmly established in Montana and all stockmen should handle their cattle in such a way as to prevent unnecessary shrinkage or death loss.

PODODERMATITIS
(Foul foot, foot-rot, etc.)

There have been reported to the Helena office 559 cases of pododermatitis during the nineteen-month period, and we are sure this constitutes but a small percentage of the cases during the period. This is considered by many stockmen and veterinarians to be potentially the most costly cattle disease in Montana at this time.

Local treatment has not proved very effective but the intravenous administration of one of the sulfa drugs, preferably sodium sulfapyridine, sulfamethazine or sulfathiazole, has given excellent results when given early. Where the drug may not be given intravenously, it may be given by bolus or in suspension by mouth.

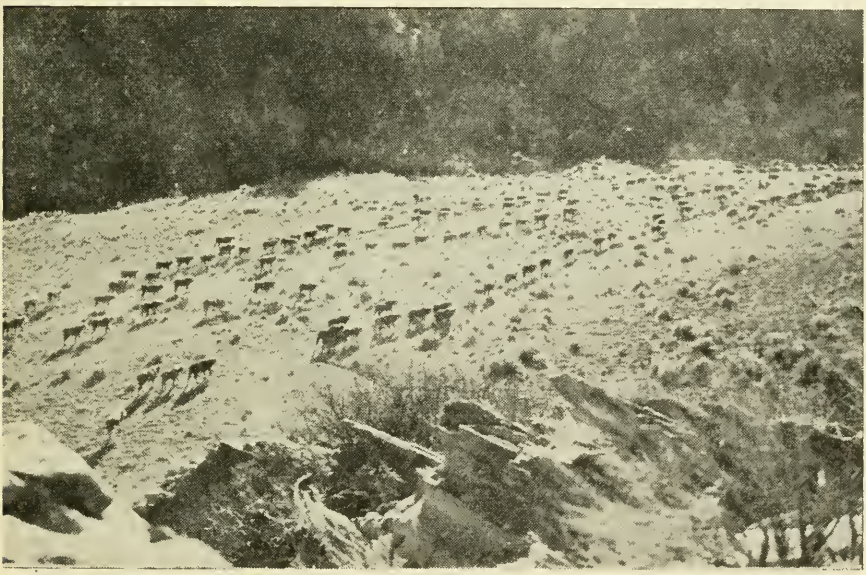
TUBERCULOSIS

Tuberculosis continues to exist in the United States and is definitely on the increase in some states, due to the manner in which cattle are dispersed through saleyards and to the apathy on the part of livestock men who seem to think it has been eradicated, and who do not give sanitary officials proper cooperation. Granted it has been greatly reduced, and in some states eradicated for all practical purposes, it MUST be remembered that a few cases do exist in most states and in some states the increase has been alarming.

Practically all cows from which milk is sold for human consumption, and a few cattle from many of the purebred and ranch herds, are tested annually. Too many years have passed, however, since all purebred herds have been tested in their entirety so we are continuing our effort to tuberculin test these herds as fast as time and opportunity permit. These various tests together with the meat inspection reports give us a good over-all picture of the disease in Montana.

During the year 1951 in cooperation with the Bureau of Animal Industry, U. S. Department of Agriculture, 23,894 cattle were tested for tuberculosis. For the 7-month period ending June 30, 1952, there were 9,894 tested, making a total of 33,788. Of this number one reacted, showing lesions indicative of tuberculosis on post-mortem examination. Not a single case of bovine tuberculosis was found in cattle slaughtered in packing plants operating under Federal inspection in Montana, and none in plants where State inspection is maintained. Whenever lesions indicative of tuberculosis are found, it is required that the lesions be forwarded to the Montana Livestock Sanitary Board Laboratories for verification and typing. At times lesions are found which closely resemble those of tuberculosis but which fail to contain the organism responsible for bovine tuberculosis. This was the case in the three reported under meat inspection.

When tuberculosis is found, either by test or on post-mortem inspection at slaughtering establishments all cattle associated with the infected animal, or animals, are tested and retested until the herd has passed three consecutive negative tests not less than sixty days apart. By adhering strictly to this practice, we have been very successful in our program to control and eradicate tuberculosis.



Tuberculosis has seldom been found in Montana range cattle.

In Montana from January 1, 1951, through December 31, 1951, a total of 27,058 cattle and 1,196 calves were slaughtered under Federal supervision and from January 1, 1952, through June 30, 1952, a total of 11,490 cattle and 554 calves were slaughtered under Federal supervision. From January 1, 1951, through June 30, 1952, a total of 8,352 cattle and 856 calves were slaughtered under State supervision, making a total of 46,900 cattle and 2,606 calves slaughtered under inspection.

During 1951 we received a report showing that 12 Montana cattle were affected with tuberculosis when slaughtered under official supervision in another state. These cattle had been in a feedlot with other cattle for several months. On test of the herd of 975 head from which they originated not a single reactor was found.

Of the 83,294 cattle and calves tested or inspected under Federal and State meat inspection in Montana from January 1, 1951, through June 30, 1952, only one case of bovine tuberculosis was disclosed. This does not mean that our cattle are absolutely free of tuberculosis, but it does definitely indicate that the foci of infection are very limited.

APLASTIC ANEMIA OF CATTLE ASSOCIATED WITH INGESTION OF TRICHLOROETHYLENE-EXTRACTED SOYBEAN OIL MEAL

Poisoning of cattle from trichloroethylene-extracted soybean oil meal was diagnosed in cattle in Montana for the first time in March, 1952.

This syndrome in cattle was first described in 1916 following an epidemic that occurred in Scotland. Other reports appeared in the literature from Holland and Germany in the 1920's, and in recent years reports have appeared in the literature from Japan and Hawaii. In the United States it was first recognized in Iowa in 1948 and has since been observed in several states.

The toxic agent as yet has not been identified and whether it is transmitted through milk of affected cows is an "unknown," currently under investigation. The poisonous chemical is apparently the result of a combination of the action of trichloroethylene on the soybean itself. Horses and sheep have been affected just as cattle, but guinea pigs, rats and mice have not been affected. There is some disagreement as to the effect on chickens, turkeys and swine.

The toxic effect as seen in cattle varies with the age of the animal, amount of feed consumed and length of time fed, stage of lactation and level of milk production. Due to a shortage of feed in eastern Montana this past winter, a number of ranchers fed a trichloroethylene-extracted soybean oil meal as a supplement. Losses started occurring in some of the herds as early as 21 days after they had been fed two pounds daily of this processed feed.

The most common symptoms observed were: petechial and ecchymotic hemorrhages of the visible mucous membranes, nasal and intestinal bleeding, marked anemia, elevated temperatures and extreme weakness. Many abortions were associated with the poisoning, some of which could be attributed to the poisoning and some to brucellosis. Observations indicate that symptoms may appear weeks to months after the feeding of the meal has been discontinued. In many cases death occurred within a few days after the first visible symptoms. Approximately 50 per cent of the cattle which ate the processed meal became ill.

Predominant post-mortem findings were petechial and massive hemorrhages in all tissues and body cavities. Microscopic examination of blood smears from affected animals revealed extensive blood changes. The average blood counts were 3,440 leucocytes, and 3,500,000 erythrocytes. The differential counts revealed 90 to 100 per cent lymphocytes, and occasional granular cells. A few smears revealed an increased eosinophile count. In many cases the entire smear had to be examined to find 100 leucocytes.

At least 20 herds of cattle were affected in this outbreak in Montana and approximately 300 animals died. Similar losses were encountered in North Dakota.

As soon as the diagnosis of trichloroethylene poisoning was made, all livestock men were advised of the danger of feeding this supplement and to discontinue its use. Mr. Alfred R. Anderson, Commissioner of Agriculture for the State of Montana, sent out the following letter to all handlers of commercial feeds:

"Gentlemen:

You are informed that any commercial feed offered for sale in the State of Montana, mixed or unmixed, containing any soybean oil meal, flakes or pellets manufactured by the trichloroethylene solvent process must comply with the following state regulations as to labeling requirements:

Any commercial feed containing trichloroethylene solvents extracted soybean oil meal, flakes or pellets must show on the tag or label the process of manufacture and a warning statement, in bold type, prohibiting its use in rations for calves, dairy and beef cattle.

This is in conformity with pronouncements of the National Association of Feed Control Officials and is for the protection of the purchaser of the feed, as well as the manufacturer who may be held responsible for damages suffered because feed is held injurious to livestock.

We feel our responsibility in promulgating this regulation and since soybean oil products are an ingredient in such a large percentage of commercial feeds, we are sending this to all manufacturers of commercial feeds sold in Montana, of record. If it does not apply to your feed, please disregard this letter. If it does, kindly conform and help eliminate the possibility of losses that might result from feeding this kind of a product to cattle.

Thanking you for your full cooperation, I am

Sincerely yours,
ALFRED R. ANDERSON
Commissioner of Agriculture"

However, several months after discontinuing its use there were occasional deaths of cattle in some of the affected herds, and spot checks revealed abnormal blood pictures in many instances.

During this outbreak in cattle, six humans who had consumed large quantities of raw milk from dairy cattle which had been fed trichloroethylene-processed soybean meal exhibited varying symptoms and/or blood changes similar to those found in the cattle, and two human deaths occurred.

Circumstantial evidence, symptoms exhibited, pathology and blood pictures would indicate that there was a relationship between the human cases and the cattle cases. However, some authorities question this tie-up. Because of the probable danger and in order to properly safeguard the public health, a joint statement was released for the press by the State Board of Health and the Livestock Sanitary Board:

"For Immediate Release
May 10, 1952
State Board of Health

Recent outbreaks of disease and death loss have been reported in Montana cattle given soybean feeds extracted with trichloroethylene. There is also danger of illness in humans using milk from cattle fed on those feeds.

Dr. H. F. Wilkins, State Veterinarian and Executive Officer of the Livestock Sanitary Board, and Dr. G. D. Carlyle Thompson, Executive Officer of the Montana State Board of Health, reported jointly today that all milk from cattle fed on such feeds is banned from public milk supplies and they warn all farmers and ranchers with cattle fed on such feeds not to use milk from these cattle for human or calf feeding.

Dr. Wilkins reports that all public milk supplies in eastern Montana counties—where the disease has occurred—have been checked and found to be from safe sources. Wilkins said that continued checks will be made by the district deputy State veterinarian to assure safe public milk supplies."

Because of the apparent relationship of human and animal health, sufficient interest was developed to bring about meetings of scientists, manufacturers, physicians and veterinarians, with the result that the processing of soybeans with trichloroethylene will be discontinued, or if used, the meal will not be offered for animal feed.

A great deal of credit must be given to the Montana veterinarians, Dr. Gail E. Hawley, Dr. D. C. Baker, Dr. L. E. Witt and Dr. G. C. Halver, who participated in bringing to the attention of the public the danger associated with the use of this soybean meal feed. Physicians in the area were very helpful and they deserve much credit for cooperating with veterinarians in an attempt to solve this mutual problem.

MISCELLANEOUS

White muscle disease of calves and lambs has been intensively investigated in relation to the alpha tocopherol content of milk, blood, and hay. A reliable test for alpha tocopherol in milk has been perfected.

The problem of calf tetany has again caused losses in northeast Montana. Trichloroethylene-extracted soybean meal has been responsible for heavy calf and cow losses. Neoplasms of chickens, cows and calves; navel infection of calves and lambs; pink eye of cattle; swine and turkey erysipelas; blackleg of cattle; Newcastle disease and infectious bronchitis of fowls all have been studied. An unidentified Gram-positive, non-motile, non-sporulating rod has been recovered from 2 cases of acute mandibular phlegmon in cattle. Listerellosis in sheep from eastern and western Montana was diagnosed. Enterotoxemia of calves and lambs has been studied in relation to toxin type. The serological study of cattle leptospirosis was continued. Tetanus in sheep, rarely seen in Montana, was diagnosed, as were vitamin B deficiencies of swine and fowls. Feeder lambs continue to die from coccidiosis as do range lambs with other intestinal parasits such as **Nematodirus** and **Trichostrongylus.** An unusual situation of canine brucellosis was diagnosed.

CONTAGIOUS ECTHYMA

Contagious ecthyma, a virus disease of sheep and goats, occurs most commonly in lambs about shipping time in the fall but may occur at any season of the year. Financial loss from this disease may be heavy at shipping time. Very young lambs and yearlings may also be affected and recently it has been observed in old ewes.

This virus is so widely disseminated that lambs not vaccinated are very apt to become infected during the summer, at time of shipping, or in the feedlots soon after arrival at destination. **It is, therefore, recommended that all lambs be vaccinated at docking time** but it may be done at any time if conditions warrant. Vaccination has become so general in recent years that contagious ecthyma is rarely seen at shipping time, other than in unvaccinated lambs. This is one disease which will be difficult to eradicate but it can be an inexpensive disease even though our sheepmen are obliged to live with it.

ENTEROTOXEMIA

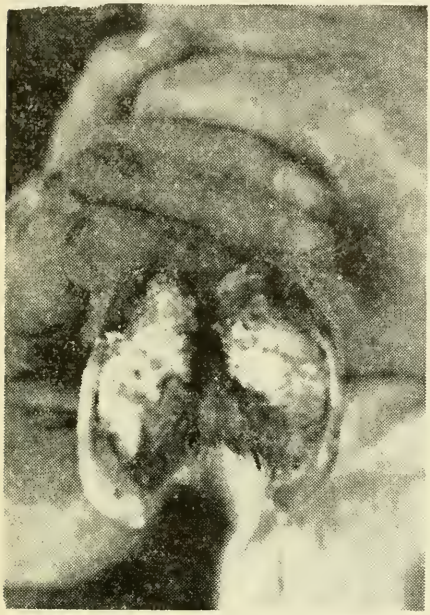
There were 151 cases of enterotoxemia diagnosed in 17,157 sheep inspected this past year and from November 30, 1951, through June 30, 1952, there were 7,177 sheep inspected and 95 were found to be affected.

As stated in previous reports, this condition affects the best and fastest-growing lambs, usually between two and six weeks of age. It also makes its appearance in lambs on lush feed or on heavy concentrated feeds in feedlots but has also been diagnosed in older sheep.

Enterotoxemia in young lambs can be satisfactorily prevented by the use of **Clostridium perfringens** Type D antitoxin. Feedlot lambs can be immunized with **Clostridium perfringens** bacterin at a very nominal cost and no lamb feeder should take a chance on losing lambs from this disease. Experimental work is being continued to determine the efficacy of immunizing the ewe to prevent the disease in the young lamb.

FOOT ROT IN SHEEP

Foot rot in sheep is a disease of the feet produced by an infection which causes destruction of the soft tissues just beneath the horn of the hoof, causing separation of the soft and horny tissues. It usually starts at the heel or between the toes and progressively undermines until, within a short time most or all of the hoof is separated from its matrix or horn-growing tissue by a foul-smelling, dirty gray, cheesy material. This results in severe lameness, deformity of the hooves, emaciation, failure to produce milk, loss of lambs, low wool production and occasionally death. In the early stages there is tenderness and reddening of the skin over the inner face of the bulb of the heel, or between the toes. This is followed by a breaking down of the tissues and the appearance of a moist gray material on the surface. From this period undermining usually progresses rapidly.



Foot with horn of sole removed, showing gray necrotic material.

Extensive foot rot with practically all of the undermined horn removed.

True foot rot can be easily differentiated from ordinary abscesses of the feet due to other infections, such as complicated ulcerative dermatosis, or injuries. In these cases there is swelling, containing pus, extending above the hoof or between the digits. This type of condition has been observed in bands of sheep with foot rot, but cannot be considered a complication of true foot rot in sheep.

At the present time the only known foot rot in sheep in Montana is confined to two bands which will be carefully rechecked this fall. All sheep in these bands have been set up and the diseased sheep treated one or more times. Two bands of sheep were imported this spring showing a heavy foot-rot infection. These imported sheep had been inspected prior to shipment and certified as free from disease, but when re-inspected by our district veterinarian at the time of issuing the quarantine, foot rot was disclosed. This is a classic example of the value of quarantine and re-inspection of imported sheep. Immediate action was taken to eradicate the disease, however, the final set up will not take place until fall. It is certainly apparent that all sheepmen must be on guard against this disease as well as sheep scab and all other diseases. Foot rot is much more difficult and costly to eradicate than sheep scab.

Should a number of sheep in a band show unexplained lameness, the operator should notify the Montana Livestock Sanitary Board or nearest veterinarian, at once. Foot rot is a reportable disease and is usually easy to eradicate when there are only a few cases. A delay in starting control can be very costly. It must always be remembered that this is a treacherous and costly disease and that it is not eradicated until the last case has been completely cured or slaughtered.

ALWAYS SEGREGATE ALL NEW ADDITIONS (WHETHER NATIVE OR IMPORTED) FOR SEVERAL WEEKS FOR OBSERVATION BEFORE PERMITTING THEM TO MINGLE WITH NATIVE SHEEP.

LISTERELLOSIS

Listerellosis has only been recognized as a distinct disease entity since 1931 when its cause was determined. Since that time it has been diagnosed in practically every country in the world, and in many of the states of the United States. In some states losses from this disease have been quite large and veterinarians are of the opinion that it may be one of our serious disease problems in the future.

During the past nineteen months there were five outbreaks of listerellosis reported in sheep in Montana involving approximately ten thousand animals.

The most common symptoms in affected sheep are depression, weakness, incoordination of movement, fever, walking in circles in the same direction, pushing against objects and progressive paralysis. Death usually follows within two or three days. The symptoms in cattle are similar to those observed in sheep.

It will be noted that the symptoms manifested in this disease are quite similar to those associated with encephalomyelitis (sleeping sickness) in horses, brain abscesses, and in most of those diseases which affect the central nervous system. For this reason, it is impossible to make a positive diagnosis in the field. In order for one to be certain of his diagnosis, laboratory confirmation is essential. A brain from an infected animal should be placed in a jar, packed in ice or ice and sawdust, and sent to the Livestock Sanitary Board at Helena.

It appears that this disease might be brought on by certain changes in feed—such as changing to silage. An increased incidence has been observed in some bands of sheep after they had been fed silage or were turned out into cornfields; however, definite proof of this has not yet been determined. No satisfactory preventive vaccines or other measures are known. So far losses in Montana have not been great but its known presence in Montana poses another threat to the health of our livestock. With this in mind, we are trying to accumulate all the information possible in order that further dissemination of this disease may be curtailed.

It is known that the organism **Listerella monocytogenes** is very resistant and is not destroyed when the animal body decomposes and disintegrates. It is, therefore, recommended that all animals suspected of dying of this disease be sent to a rendering plant, buried deeply and covered with lime, or completely burned. Such a practice will minimize premise contamination and will assist materially in limiting its distribution.

Treatment with modern drugs has not given what is generally recognized as satisfactory results, even though a few animals may have recovered. When first seen, most animals are hopelessly ill with sufficient brain damage produced by the infection to make treatment unsatisfactory or useless.

SHEEP SCABIES

A concerted national effort is now being made to eradicate sheep scabies from the United States. All states west of the Mississippi River, where scabies exists, are putting forth their best efforts to completely eradicate this disease. The U. S. Bureau of Animal Industry is directing its greatest attention in Louisiana and Mississippi but they are also helping all they can with the scabies-eradication program in other states where scabies exists. Most states are looking forward to the day when this disease will no longer be a threat to the sheep industry.

Sheep scabies came dangerously close to southeastern Montana in the summer of 1950 when it appeared in South Dakota. The last scabies-infected band of sheep came from Chicago in 1921, so Montana has been free from this disease for thirty-one years. This disease can and, with sufficient effort, will be eradicated from the United States.

Internal parasite control is easily accomplished when sheep are properly managed on the summer range.

ULCERATIVE DERMATOSIS
(Lip-and-leg ulceration)

A study of the etiological agent of ulcerative dermatosis is being conducted at the Veterinary Research Laboratory, but so far results have been unsatisfactory. The virus is very difficult to isolate and propogate by any known method.

During 1951, 25,206 sheep were inspected for ulcerative dermatosis, of which 3,146 were found to be affected. During the period December1, 1951, through June 30, 1952, there were 900 sheep inspected with five found to be affected. There is a marked increase in the incidence of this disease throughout the Rocky Mountain region. The peak is usually reached in the late fall and winter. Some sheepmen fear they will be obliged to go out of the sheep business unless a successful preventive can be perfected. For about seven years this disease has appeared and assumed an increasing malignant form similar to that reported in the late 90's and early 1900's. From 1916 to about 1945 the disease was relatively uncommon and mild. Just what has caused its increased incidence and virulence is not known.

ATROPHIC OR DYSTROPHIC RHINITIS

This condition has been variously called atrophic or dystrophic rhinitis, and may be incorrectly diagnosed as "bull nose." It is definitely an infectious disease, the cause of which is not known. It is prone to develop in young pigs—4 to 8 weeks of age—showing classic symptoms. Mature swine acquiring the disease do not always develop the distorted nose and face but are carriers of the infection and probably the principal source of spread. The usual symptoms and lesions have been described in the June 1951 issue of the NORTH AMERICAN VETERINARIAN:

Animals which have atrophic rhinitis often continue to be unthrifty regardless of how well they are fed and cared for.

"Atrophic rhinitis affects particularly the turbinate structures. Affected animals usually sneeze and show other evidence of irritation of the nasal passages, such as shaking the head, rubbing the snout against fences, walls or other objects, and pushing the snout into loose soil or litter. The sneezing is sometimes very violent. Nose bleed occurs rather commonly. The bleeding from the nose may be copious and probably sometimes plays a part in causing unthriftiness. The most characteristic clinical symptom is the peculiar distortion of the snout and face. However, well marked deformity or distortion does not always occur. Moreover, it is sometimes difficult to distinguish between these snout and facial changes and the dish face which occurs normally in some breeds or strains of hogs. Atrophic rhinitis may cause the snout to turn to either side or upward. Sometimes the snout and face become wrinkled so as to give something of an accordion appearance. In such cases there is usually an undershot jaw.

MORBID ANATOMY

"The characteristic lesion of atrophic rhinitis is found in the nose. It consists of partial or complete absence of the principal turbinate bones and associated mucous membrane. Because of the difficulties in making a positive clinical diagnosis in some herds, it may be necessary to conduct a postmortem examination before reaching a conclusion. When the snout is opened longitudinally near the midline and the nasal septum is removed, the turbinate structures, or the places where they should be, can be seen. The principal turbinate structures may be partially or completely absent from one or both sides. Sometimes there is more or less exudate in the nasal and paranasal sinuses. Accumulations of soil or other foreign material may be found in the nasal passages, particularly in the anterior portions."

Regarding control of this disease, Dr. L. P. Doyle, of Purdue University, continues in his article in THE NORTH AMERICAN VETERINARIAN:

"The most effective method of eradication is to send the entire affected herd to slaughter and then restock from a healthy source after the houses and equipment have been cleaned and disinfected."

It would be our recommendation that the houses and equipment which have been cleaned and disinfected be left vacant for at least a year.

Atrophic rhinitis was diagnosed in one hog herd in 1951 and three herds in 1952. They have all been quarantined and will be sold for slaughter, and the premises prepared as recommended before restocking.

Purebred hogs are the principal source of infection and have been recognized as the prime source of its wide dissemination in the cornbelt. All purchasers of purebred swine should specifically require certification from the owner and certifying veterinarian that atrophic rhinitis has never been known to exist in the **herd.**

BRUCELLOSIS

Brucellosis was not diagnosed in swine during this reporting period but 32 animals were tested, with negative results. It is urged that swine owners strictly comply with all regulations governing the importation of swine and adhere to recommendations governing isolation of all additions. Every effort will be made to eliminate brucellosis from any hog herd in which the disease is diagnosed and, with proper cooperation, it should not become a serious problem in Montana.

ERYSIPELAS

In 1951 and up to July 1, 1952, 3,943 hogs were inspected and examined for erysipelas, of which 631 were found to be affected. This is becoming a serious hog disease but it now appears a satisfactory bacterin for its prevention may soon be available.

HOG CHOLERA

During 1951, and up to July 1, 1952, hog cholera was diagnosed on 23 premises. Practically all primary hog cholera breaks in Montana have been traced to the feeding of garbage. This was particularly evident in the outbreaks in western Montana this spring which caused serious and unnecessary financial loss to a number of legitimate hog raisers in Missoula and Ravalli counties.

All garbage-feeding ranches are required to be permanently quarantined and all hogs on such ranches must be vaccinated and held in quarantine until moved for slaughter. All district veterinarians are required to carefully check all garbage-feeding plants in their district so that the owners may be properly informed of the danger of the introduction of hog cholera and of our regulations governing the vaccination of hogs.

VESICULAR EXANTHEMA

Vesicular exanthema is a serious disease of swine, which is clinically indistinguishable from foot-and-mouth disease in hogs. Because of its close resemblance to foot-and-mouth disease, a differential diagnosis can only be made by the use of test animals. Vesicular exanthema is not transmissible to man.

The present outbreak, which first appeared in Nebraska in a lot of garbage-fed hogs near Cheyenne, Wyoming, about the middle of June occurred in hogs that were being fed garbage from a transcontinental train. No doubt this outbreak was caused by the eating of pork scraps from California garbage-fed hogs, since the disease is known to have existed there since 1932. Vesicular exanthema has spread rapidly to swine in several states, indicating it can infect hogs regardless of whether they are garbage or grain fed.

Officials have for the past twenty years been very fearful that vesicular exanthema would some day escape from California and cause devastating losses to the swine industry of this country. Just what these losses may amount to, should the disease not be eradicated, can be deducted from the following paragraph taken from California's special report of 1952:

"The economic importance of vesicular exanthema on California garbage-feeding ranches has never been accurately appraised. To say the cost is high is conservative. In fat hogs a severe attack of the disease literally melts the fat away and it is not uncommon for such hogs to lose 50 to 75 pounds in a matter of hours. Heavy boars and sows often shed the horny toe of one or more feet and move about on bloody stumps. Understandably, animals thus affected require a long time to come back to health or service. They often die of secondary infections. Sows with litters of nursing pigs often dry up and the pigs die of starvation because of lack of milk or because, if the little pigs are sick, their nasal openings are plugged tightly with blood and serous exudate, making it impossible for them to breathe if they do try to nurse. Many garbage feeders have been forced to discontinue brooding sows because of the uncertainty of their chances of raising replacements.

"In some instances when the disease is of an unusually virulent form, losses may be appreciable. When it gets into the brood sheds an entire year's crop of baby pigs may be lost in a week. One large feeder in Alameda County estimated a baby pig loss of $25,000 in one outbreak. Not only were his pigs lost, but he was forced because of that loss to buy replacements later on the open market.

"Fat hogs are set back and require additional feeding to bring the survivors back to marketable condition. Feeders fail to respond to feed or treatment and because they are sick, and consequently of low resistance, a percentage succumb to pneumonia or enteritis."

It is very evident from the foregoing statement that vesicular exanthema can be most destructive and that the Bureau of Animal Industry, U. S. Department of Agriculture, in cooperation with the various states should declare an emergency and do everything possible to eradicate this disease with all possible speed.

All Montana veterinarians have been alerted and everything possible will be done to prevent its introduction into Montana or if it should get in to effectively control and eradicate it.

MISCELLANEOUS DISEASES OF SWINE

During the past nineteen months 18,620 swine were inspected for various diseases, including hog cholera. In addition to the diseases mentioned, many swine were found to be heavily infested with the large round worm (**Ascaris suis**). Swine owners have been advised relative to the loss occasioned by parasites and of means for their control. Most Montana hogs are heavily infested with ascarids and because of the pathological conditions produced by them, such as icterus of the tissues and liver damage, an astounding number of hogs and hog livers must be condemned. Slaughterers will soon be obliged to buy at lower prices to prevent this huge loss from condemnations. **Hog raisers should learn how to grow hogs which are free from ascarids.**

GARBAGE FEEDING

Garbage feeding in Montana is a relatively small business and has not been of much concern until recently. Montana has for many years required the vaccination against hog cholera of all hogs which are fed raw garbage, as well as the quarantining of all garbage-feeding establishments. No hogs are permitted to leave garbage-feeding premises other than for immediate slaughter unless under special permit. Consideration has been given to a regulation requiring the cooking or sterilization of all garbage fed to swine but no definite steps have been taken to accomplish this.

According to many livestock sanitary officials, including the Executive Officer of the Montana Livestock Sanitary Board, the feeding of uncooked garbage is a tremendous threat to the health and stability of the livestock industry of the United States. It is shocking, when we realize the significance of this problem, to know that there has not been a Nation-wide effort to require the cooking of all garbage fed to swine or other animals, as is required in Canada and some other countries.

It is doubtful that the hazardous and expensive practice of feeding raw garbage to hogs has ever paid dividends on a Nation-wide basis. Garbage feeders keep poor records so it is difficult to determine accurately what losses are sustained in a garbage-feeding plant, either by loss of flesh or by death.

It has been definitely established that the last two outbreaks of foot-and-mouth disease in this country (both were in California) originated in hogs fed raw garbage. The 1924 outbreak in California occurred in a garbage-feeding lot consisting of 515 swine which were fed garbage taken from a foreign ship. This outbreak required the slaughter of almost 110,000 animals valued at over $4¼ million. Other losses due to various embargoes and restrictions on the sale and movement of goods of almost every description increased the cost by millions. The 1929 outbreak was discovered early and only 4,291 animals were destroyed, valued at almost $108,000.

It is to be remembered that the present outbreak of vesicular exanthema in swine in the United States was traced to the feeding of garbage taken from a transcontinental train and fed to hogs at a Cheyenne, Wyoming garbage-feeding plant. It has been estimated that at least 75% of all primary oubreaks of hog cholera in Montana in the past have been traced to the feeding of raw garbage to swine. It is also known that the feeding of raw garbage is one of the best means by which trichinosis (a very serious human parasitic disease) is perpetuated. No one who has witnessed human suffering and death associated with a heavy infestation of **Trichina** larva would ever hesitate to demand that all garbage in this Nation be cooked before it is used as livestock feed.

In addition to the foregoing, we know that garbage has been the means of transmitting many other diseases, such as anthrax, tuberculosis, swine erysipelas, salmonellosis and atrophic rhinitis.

Every effort is going to be exerted to bring about complete sterilization of all garbage fed to swine in the State of Montana. This, I am sure, will contribute much toward decreasing the incidence of swine diseases and the transmission of certain diseases to other animals and to man.

HORSES

EQUINE ENCEPHALOMYELITIS

There were 21 cases of encephalomyelitis officially reported in Montana in 1951, and during the following seven months, 6 cases were reported. From unofficial information we know there were more but no serious losses were reported anywhere in the State up to July 1, 1952.

It is recommended that good saddle and work horses on ranches, as well as private horses and any valuable horses, be vaccinated before July 1 each year, since that seems to be the time when the disease usually begins to make its appearance.

STALLION REGISTRATION BOARD

It is recommended that the law creating the Stallion Registration Board be repealed as it is no longer needed. During 1951 the Montana Livestock Sanitary Board, acting as the Stallion Registration Board, issued 2 licenses for purebred stallions but during the following seven months up to July 1, 1952, no more such licenses had been issued.

DOGS
RABIES

During the spring of 1951, we had quite a serious outbreak of rabies in Billings (the first case to appear in Montana since 1929), which was completely eradicated under the able direction of Dr. J. W. Safford.

Rabies was introduced by means of an imported dog and the disease reached epizootic proportions in and adjacent to the City of Billings, Montana. The first case was reported in a dog on January 27, 1951. In March, six dogs were reported affected, and in April, three dogs and two cats were reported affected with this disease. The last case was a cat reported April 17, 1951.

Fourteen humans were reported to have been exposed to the above-mentioned animals and submitted to anti-rabies prophylaxis.

A county-wide ninety-day quarantine was imposed on Yellowstone County by this department requiring the confinement and vaccination of all dogs and cats, and the elimination of all strays. Within one week following the inauguration of this county-wide quarantine, 6,048 dogs and cats were vaccinated and a total of 6,603 animals were vaccinated during the entire quarantine period. Based on population, almost 100% of all dogs in the county were vaccinated.

Thirty-two days following the beginning of this quarantine and 25 days following completion of the county-wide vaccination program, the last rabid animal was reported.

As a result of the Billings epizootic, many cities and towns adopted compulsory rabies-vaccination programs. Over 17,000 dogs and 1,600 cats were reported vaccinated in the State in 1951, and during the first six months of 1952 our reports show that 6,973 dogs and 3,536 cats were vaccinated.

Routine intra-cerebral inoculation of mice for rabies examination.

Rabies has for the past four years been disseminated in the west central states, principally through skunks and cats, which is making its control and eradication extremely difficult, as demonstrated in Minnesota, North and South Dakota. Two years ago North Dakota officials greatly feared the introduction of rabies into their state from Minnesota or South Dakota. Since it appeared to be spreading primarily through the medium of skunks, an attempt was made to secure adequate and proper help for a skunk-eradication campaign, but without success. As a result, rabies has spread to almost all sections of that state and as far west as Williston, North Dakota, near the Montana border.

Since rabies is a terrifying fatal disease, and a very costly one, every effort was made to enlist the help of all interested departments and people—such as the State Board of Health, Extension Service, U. S. Fish and Wildlife Service, Fish and Game Department, U. S. Bureau of Animal Industry, livestock organizations, all veterinarians, farmers, ranchers, peace and law enforcement officers, as well as all other interested organizations, civic clubs and individuals—to assist with a rabies-prevention program in eastern Montana. Due to severe weather and bad roads, vaccination schedules were difficult to execute as planned but with the excellent assistance given by the various cooperating agencies and the inhabitants of the area, it is estimated that better than an 80% coverage of all dogs and cats was attained in an area approximately 100 miles wide bordering North and South Dakota. A high percentage of stray dogs and homeless cats was destroyed. The program was particularly stressed in rural areas as a protection to humans, livestock and wild game.

In the area threatened by rabies, a campaign for the extermination of all skunks, coyotes, wolves, badgers, foxes, lynx, wildcats, rats and any other wild animals or rodents which might spread the disease, was inaugurated under the direction of the U. S. Fish and Wildlife Service, with the Montana Fish and Game Department and all cooperating agencies assisting. A splendid job was done in the areas worked but lack of time and personnel prevented a complete coverage.

We have strongly stressed the importance of preventing rabies because it is of such vital concern to public health, our wild animals and livestock, not to mention the demoralizing effect an outbreak of rabies would have upon a community. As of June 30, 1952, rabies had not been diagnosed in Montana even though the disease has been reported near our border in both North and South Dakota. We feel the rabies-prevention program has been of great value to all of the people of Montana and that it may have prevented another serious rabies outbreak. It was most gratifying to observe the excellent cooperation among all agencies and individuals working together for the common good.

With the cooperation of local, state and National agencies, working together as a unit as they did in Montana, it is very evident that rabies can be completely eradicated from the United States. Its perpetuation is a disgrace to the regulatory and health organizations of this Nation.

POULTRY

A total of 950 birds were examined in the laboratory for the year ending November 30, 1951, and 600 birds for the following seven months, making a total of 1,550. This total includes chickens, turkeys, pheasants, sparrows, geese, ducks and canaries.

The usual diagnoses of poultry diseases were made with no great increase in any particular disease.

In 1951, however, we experienced one outbreak of fowl pox involving 600 chickens, in which approximately one-half of the birds were infected. The mortality was low and egg production was not seriously affected. This poultry producer also had a flock of 800 pullets which was entirely seperated from the old infected birds. The pullets were vaccinated with pigeon pox vaccine and a thorough program of cleaning and disinfecting was carried out. Up to June 30, 1952, the disease had not reappeared.

Seven outbreaks of Newcastle disease were officially diagnosed during the year ending November 30, 1951, and two cases for the following seven months.

In April of 1952, infectious bronchitis was diagnosed in two flocks of baby chicks. Both flocks had been purchased from a hatchery in Montana. An immediate inspection was made of the hatchery and two chick batteries containing 35,000 chicks were found to be infected, so were destroyed immediately.

Further investigation revealed the source of infection was originating from another hatchery which was supplying hatching eggs. Chicks totalling 7,500 were destroyed at this hatchery. Complete supervision of the cleaning and disinfecting of these hatcheries and premises were under the direction of the Poultry Improvement Board and the Livestock Sanitary Board.

This hatchery had also supplied chicks to another hatchery in the State and shortly thereafter infectious bronchitis was diagnosed in chicks from the third hatchery. A total of 7,000 chicks had to be destroyed and thorough cleaning and disinfecting of the hatchery and equipment was necessary.

Two other outbreaks were located and proper steps taken to eliminate the infection. All hatcheries and premises were placed under quarantine until all danger of further spread was eliminated.

A total of 99,400 birds were infected and an approximate total of 50,000 birds were destroyed, because of this outbreak of infectious bronchitis.

The eradication of this disease saved the poultrymen of Montana many thousands of dollars and also demonstrated that infectious bronchitis can be successfully eradicated from hatcheries. The primary source of infection was not definitely determined but was probably imported hatching eggs. Its wide dissemination among chicks was attributed to bad management practices in the hatchery and to overstocking. The cost of eradication to the hatcherymen was very high but had it not been completely eradicated, the disease would have been ruinous to the business of the hatcheries involved. If such a disease is detected early, control and eradication can be effected with a minimum of loss. Even a few hours' delay may necessitate the destruction of all chicks in a hatchery.

A total of 26,803 birds were inspected in the field by veterinarians and laboratory personnel over the year and one-half period.

The Livestock Sanitary Board, cooperating with the Poultry Improvement Board and the hatcherymen, tested 54,231 birds for pullorum disease during the year 1951 and 398 reactors were disclosed. During the following seven months 31,564 birds were tested with 17 reactors disclosed. With continued constructive testing and cooperation, pullorum disease in poultry in Montana will soon be reduced to an absolute minimum.

Approximately 15 years ago the North Montana Fair Board, as well as one or two of the smaller fair boards, called upon this department and requested help in controlling disease in the birds while they were on exhibit at the poultry show. The many experienced exhibitors who had expensive show birds were complaining because of the great number of diseased birds being brought to the fair by other exhibitors. These owners brought well and healthy birds but when they took them home they were suffering from respiratory or other diseases, which they contracted while at the show. Many birds died while on exhibition.

Investigation revealed that there were diseased birds being brought to the fairs and that mortality was exceedingly high.

Every year since that time this department has had a representative at the larger fairs. An inspection of the birds is made at the time of their arrival and two to three inspections are made every day thereafter. Any birds which reveal signs of illness are immediately removed from the exhibition room and placed in an isolation ward. They are treated and if they recover satisfactorily they are placed back in the show room; otherwise, they remain in quarantine.

It was necessary to formulate a regulation governing the exhibition of birds at poultry shows in Montana. This regulation requires vaccination of all birds against Newcastle disease. It also requires that an official health

certificate accompany the birds at the time of their arrival. Following the show, this certificate is filed at the office of the Livestock Sanitary Board.

Cooperation from the Board and personnel of the North Montana State Fair has been excellent, but similar cooperation is needed from all fairs. Poultry shows can be great reservoirs for the dissemination of diseases and every effort should be made to minimize this threat.

MILK SANITATION

The prime importance of milk in the general welfare of mankind emphasizes the necessity for proper supervision of the production and processing of milk and milk products. This supervision should not be burdensome on the industry but should result in a safe, high quality product for the consuming public.

By the adoption of the U. S. Public Health Standard Milk Ordinance, we have tried to promote good working relations between producer, processor and sanitarian. The Standard Ordinance makes for a good method of comparison with milk supplies from outside our own state. This problem of interstate milk in commerce makes such a comparison of vital importance.

New products and new methods are also adopted in compliance with the U. S. Public Health Service Code.

At present more high-temperature short-time units are being installed with new cleaning methods suggested for cleaned-in-place milk pipe lines.

Pipe-line milkers are also being installed which will make special methods of cleaning necessary.

Our district veterinarians, who are charged with the supervision and enforcement of Regulation 1, have received good cooperation from local sanitarians connected with the State Board of Health.

Public Health disease reports indicate that less outbreaks were attributed to milk or milk products than to other foods and water. We believe that this, in part, points out that our supervision of milk and milk products has had good results for the consuming public.

GUARDING MILK PURITY—Hazel Hammersland, laboratory technician, counts bacteria colonies. By counting the colonies, the technician can figure how many bacteria were present in the milk sample.

During 1951, there were 70 milk plants, 1,064 producer dairies and 59 raw-milk dairies licensed in Montana, and during the first six months of 1952 there were 70 milk plants, 987 producer dairies and 61 raw-milk dairies licensed.

MEAT INSPECTION

The following cities have passed ordinances during 1951 requiring all meat and meat products from domestic animals, for sale within said cities, to be inspected and passed either by the Montana Livestock Sanitary Board or the U. S. Bureau of Animal Industry: Kalispell, Havre, Lewistown, Dillon and Bozeman. The cities of Great Falls, Billings, Butte, Helena and Anaconda have similar ordinances. However, Butte and Anaconda have their own city inspectors and have not asked the Livestock Sanitary Board to establish State meat inspection.

The County Commissioners of Flathead County petitioned the Montana Livestock Sanitary Board for county-wide meat inspection, which request was approved by the Board at its meeting in Helena on May 21, 1952, and the Executive Officer was requested to comply with the wishes of the County Commissioners and inaugurate meat inspection on a county-wide basis in Flathead County as soon as a full-time meat inspector could be secured.

The meat-consuming public frequently asks the Livestock Sanitary Board to establish meat inspection in various places in Montana and a number of appeals have been made for the inspection of all meat and meat food products sold within the confines of the State of Montana. Such a program, as a public health measure and also as an animal disease-control measure, should be put into effect as soon as funds are available. At the present time, meat inspection under supervision of the Montana Livestock Sanitary Board is conducted at the expense of the establishment where the inspection is maintained. The official establishment is charged for the service by the Montana Livestock Sanitary Board, and in turn, the Montana Livestock Sanitary Board pays for the inspection rendered. This is the only manner in which the work can be carried on since no appropriation has been made for meat inspection.

In a few instances, it has been impossible to collect from the slaughterer all money which has been paid the inspector, but in such instances, the inspector has been occupied in carrying out disease-control or other work for the Livestock Sanitary Board.

The present meat inspection schedule has required a lot of extra work for the Livestock Sanitary Board field and office force. It has taken considerable time on the part of some district deputies to supervise some of the work of new meat inspectors and get them properly lined up in the conduct of their official duties. All work of this nature also requires additional reporting and very materially increases the work of the Helena office force.

The following plants now maintain Federal inspection:

Great Falls Meat Company, Great Falls
Hansen Packing Company, Butte
Pierce Packing Company, Billings
Midland Packing Company, Billings

The following plants now maintain State inspection:

Livingston Packing Company, Livingston
John R. Daily Company, Missoula
John Schramm and Son, Missoula
Montana Meat Company, Helena
Berger Meat Company, Great Falls
Kalispell Meat Company, Kalispell
North Side Market, Great Falls
Western Meat Company, Missoula
Havre Abattoir, Havre
Frazer Meat Company, Stevensville
Vollmer and Sons, Bozeman
Montana Market, Great Falls
Roberts Food Market, Dillon
Val Faro's, Black Eagle
Eustance Market, Great Falls
Rocky Mountain Meat Company, Havre
Tobia's Market, Lewistown
Stafford's Market, Great Falls

The following is a summary of condemnations made by the Livestock Sanitary Board during 1951:

SUMMARY OF POST MORTEM INSPECTION

Species	Cattle	Swine	Calves	Sheep
Food	14,182	46,613	1,435	1,506
Cooking	6	12	2	
Condemned	54	79	9	4
TOTAL	14,242	46,704	1,446	1,510
GRAND TOTAL OF ALL ANIMALS				63,902

DISPOSITION OF CARCASSES AND PARTS

DIAGNOSIS	CATTLE Food	Cook.	Con'd	Parts Con'd.	SWINE Cook.	Con'd	Parts Con'd	CALVES Cook.	Con'd	Parts Con'd	SHEEP Con'd	Parts Con'd
Tuberculosis				3		5	2275					
Actinomycosis			2	203			1			3		
Pneumonia		1	6	1	5	14				1	2	1
Septicemia			7		1	15		2				
Cysticercosis ten							19					3
Cystic ercosis bovis												
Cysticercosis, refgr.	3											
Cysticercosis												
Bruises, injuries, etc.			1	65	2		118			2		5
Abscesses		2		116	1		394		1	22		29
Epithelioma			4	48								
Swine livers							6090					
Sex odor						2						
Histerocarcinoma			2									
Traumatic gastritis			1									
Peritonitis			5		1				1			
Cachexia			7								1	
Urticaria				1			1					
Arthritis				1	1	1	21					
Pyelonephritis						1						
Gastroenteritis						3						
Erysipelas						7	5					
Septic orchitis						1						
Enteritis						2			2			
Icterus						3						
Contamination				3			150					
Gastritis											1	
Distomiasis				1						3		68
Pododermatitis				2								
Sarcosporidiosis			1									
Hem. septicemia			2						1			
Mastitis			3									
Pyemia			3			7			1			
Urinary calculi			1						3			
Polyarthritis					1	12	4					
Dermatitis							1					
T. actinoides												6
T. ovis												3
Toxemia			2									
Hog cholera						4						
Prolapsed vagina		1										
Traumatic pericarditis			2									
Nephritis			1	4		1	932			2		
Arsenic poisoning				Arsenic		Poisoning				1		
Pericarditis				18			36					
Hydronephrosis							563					
Neoplasms						1						
Metritis			1									
Hepatitis			1									
Moribund			1									
Recent parturition		2										
TOTALS	3	6	54	466	12	79	10610	2	9	33	4	113

BEEF LIVERS CONDEMNED:

Abscess	1,310
Cirrhosis	26
Telangiectosis	48
Sawdust	5
Fatty degenerations	10
Distomiasis	954
Echinococcus	5
Neoplasms	4
Contamination	5
Total:	2,367

The following is a summary of condemnations made by the Livestock Sanitary Board during the period 12/1/51-6/30/52:

SUMMARY OF POST MORTEM INSPECTION

Species	Cattle	Swine	Calves	Sheep
Food	8,296	31,204	846	1,049
Cooking	5	6		
Condemned	51	119	10	9
TOTAL	8,352	31,329	856	1,058
GRAND TOTAL OF ALL ANIMALS				41,595

DISPOSITION OF CARCASSES AND PARTS

DIAGNOSIS	CATTLE Food	Cook.	Con'd	Parts Con'd.	SWINE Cook.	Con'd	Parts Con'd	CALVES Cook.	Con'd	Parts Con'd	SHEEP Con'd	Parts Con'd
Tuberculosis				2			1511					
Actinomycosis		1	2	120		2	12					
Pneumonia					1	31	4		1		1	
Septicemia			5			7					2	
Cysticercosis ten.				3								
Cysticercosis bovis				3								
Cysticercisis, refr.												
Cysticercosis							2					
Bruises, injuries, etc.			2	51			17				1	
Abscesses				163	1	11	216			2		3
Epithelioma			7	23			14					
Livers				50			4869			5		61
Sex odor						3						
Histerocarcinoma												
Traumatic gastritis												
Peritonitis			4			4	1					
Cachexia			15							1	2	
Urticaria												
Arthritis						2	6			1		
Pyelonephritis			1									
Gastroenteritis												
Erysipelas						5	4					
Septic orchitis												
Enteritis						1						
Icterus						7					1	
Contamination				8		9	168					
Gastritis												
Distomiasis												
Pododermatitis												
Sarcosporidiosis												
Hem. septicemia												
Mastitis		1	5	1								
Pyemia			2			2						
Urinary calculi										1		
Polyarthritis					1	14						
Dermatitis												
T. actinoides												
T. ovis												
Toxemia				3						2		
Hog cholera												
Prolapsed vagina				1								
Traumatic pericarditis												
Nephritis				1			300					
Arsenic poisoning												
Pericarditis			2	7			24					
Hydronephrosis							116					
Neoplasms												
Metritis		1	1									
Hepatitis												
Moribund												
Recent parturition			1									
Ascarid scars							275					
Adhesions				5			9					
Melanosis				3			2					
Infections				1		3						
Hair-head							1					
Inflammation							3					
Hernia							1					
Necrophorus inf.		2										
Pleurisy				4		1						
Tongue sores				2								
Parasites												5
Parasites scars							10					
Gangrene-lungs										1		
Uremic poisoning										2		
Diphtheria										1		
Telangiectosis											1	
Bacteremia					3	13						
Ruptured penis				1								
Sinusitis							1					
Lymphoadenitis											1	
Adenosarcoma				1								
Pseudotuberculosis												1
General edema			1									
TOTALS	5	51	445	6	119	7566		10	7	9	70	

BEEF LIVERS CONDEMNED:

Abscesses	639
Cirrhosis	10
Telangiectosis	23
Sawdust	4
Fatty degenerations	4
Distomiasis	19
Echinococcus	2
Neoplasms	
Contamination	2
Parasites (flukes)	490
Xanthosis	1
Atrophia	1
Tumor	3
Carotenosis	3
Total:	1,201

A total of 63,902 animals were inspected on both ante-mortem and post-mortem inspection for the fiscal year 1951. One hundred forty-six animals were condemned in their entirety as unfit for human consumption and twenty animals were passed for sterilization. Of the above animals there were 13,588 parts condemned as unfit for human food. During the period December 1, 1951, through June 30, 1952 there were 41,595 inspected on both ante-mortem and post-mortem inspection. Of this number there were 189 condemned in their entirety as unfit for human consumption and eleven animals were passed for sterilization. Of the above animals there were 9,289 parts condemned as unfit for human food. The total for the entire period is as follows:

Animals inspected ante- and post-mortem inspection	105,497
" condemned in their entirety	335
" passed for sterilization	31
Parts condemned	22,877

These figures show that out of every 315 animals slaughtered one is found to be unfit for human food, and that a part of one animal out of every 4.6 is condemned for human consumption. This clearly demonstrates the public health significance of meat inspection, however, the proper supervision of the sanitary condition of slaughtering establishments, equipment, and methods are of equally great importance.

PUBLIC SALEYARDS

Approximately 50% of all cattle sold in Montana, or over 500,000 head, pass through our 13 public saleyards each year. All of these are auction markets, with the exception of the New Billings Public Stockyards.

Each year reasonably satisfactory progress has been made in improving the physical and sanitary conditions of saleyards by additional paving and general improvements in sanitary procedures. Owing to the ever-increasing volume of business several yards have been obliged to enlarge their facilities and to materially increase the paved area. Several new chutes and crowding pens have been strategicially located in some yards which have greatly facilitated the handling and testing of cattle, thus saving considerable time and expense to the yard operators. sellers and purchasers of cattle. These new chutes have minimized shrinkage and bruising of cattle and have made it possible to more efficiently handle animals which must be tested for brucellosis and other diseases.

Due to the evident spread of many diseases through market centers, many livestock owners have inquired as to the reason for this problem and what should be done about it. It is very evident that a decided improvement in the sanitary condition of most yards can be made. All yards should be regularly cleaned and maintained in a satisfactory sanitary state at all times and thoroughly cleaned, disinfected and whitewashed at least once a year. Every effort should be made to clean and disinfect pens used for holding sick cattle before they are again used.

All trucks should be cleaned and disinfected **each time they are used. When our livestock people DEMAND THIS** it will be done, but as long as they will permit their livestock to be hauled in filthy trucks it is impossible for the Livestock Sanitary Board to do much to improve the present abominable situation. The cleaning and disinfection of stock cars, trucks and stockyards should be a Nation-wide requirement and not merely one required by a few states.

Saleyards approved and licensed in Montana during 1951 and the first six months of 1952 are:

Billings Livestock Commission Company, Billings
New Billings Public Stockyards, Billings
Montana Livestock Auction Company, Butte
Shelby Stockyards Company, Shelby
Havre Livestock Commission Company, Havre
Hamilton Livestock Auction, Hamilton
Central Montana Stockyards, Lewistown
Miles City Auction, Miles City

Glendive Livestock Commission Company, Glendive
Yellowstone Livestock Commission Company, Sidney
Great Falls Livestock Commission Company, Great Falls
Missoula Livestock Auction Company, Missoula
Glasgow Livestock Sales Company, Glasgow

RENDERING PLANTS

The Montana Livestock Sanitary Board licensed 8 rendering plants in 1951 and 9 during the first six months of 1952:

Billings Rendering Company, Billings
Dillon Rendering Company, Dillon
Havre Rendering & Dehydrating Plant, Havre
*Kalispell Rendering, Kalispell
Miles City Rendering Company, Miles City
Missoula Rendering Plant, Missoula
Montana Animal Products Company, Helena
Sidney Rendering Company, Sidney
**Vollmer & Sons Rendering Plant, Bozeman
*Not now operating
**Not licensed in 1951

These plants serve a very useful purpose when they are operated in compliance with regulations. They not only remove dead animals and render them incapable of further perpetuating and disseminating many diseases, but prevent them from becoming a public nuisance. They also salvage hides and in processing the animals save tallow and make meat meal which is a very much needed product and which would otherwise be wasted. On many occasions material assistance is given to representatives of this department by rendering plant operators who notify us of suspected costly diseases which are located and suppressed.

While no accurate records are kept as to the cause of death, rendering plant operators are of the opinion that in cattle, bloat causes most deaths with "hardware disease" (the consumption of inedibles, such as wire, nails and bones), and calving in second place. Blackleg, accidents, coccidiosis and asthma also account for quite a large number of deaths among cattle. Old age and accidents account for most of the deaths in horses, while poisoning and accidents (mostly due to shipping) cause the greater number of swine and sheep losses.

During December of 1951 and the first six months of 1952 the following number of dead animals were rendered at the various plants in Montana: Cattle—6,259; horses—487; swine—679; sheep—1,498; deer—2; antelope—1, making a grand total of 8,758 dead animals handled by the 9 rendering plants in Montana during that period.

Respectfully submitted,

H. F. WILKINS, D. V. M.
State Veterinary Surgeon

THE MONTANA VETERINARY RESEARCH LABORATORY

By

Dr. E. A. TUNNICLIFF, Head

Some taxpayers may be unfamiliar with the organization of the program for control and research of animal diseases in the State of Montana. The Executive Officer of the Montana Livestock Sanitary Board is charged by law with the responsibility for the control of animal and poultry diseases. As an aid in this control, a Diagnostic Laboratory in Helena is staffed by trained personnel who assist in diagnosing these diseases so that proper control measures may be followed. However, since there are many diseases and various phases of problems for which we do not have the answers, it is absolutely necessary that the livestock men be assisted by a laboratory devoted to research problems.

This research work is carried on at the Montana Veterinary Research Laboratory, which is a department of the Agricultural Experiment Station at Montana State College in Bozeman.

It seems well to outline for those who may be unfamiliar with the organization of the Veterinary Research Laboratory, the relationship between the Livestock Sanitary Board and the Veterinary Research Laboratory. The Veterinary Research Laboratory was organized in 1929 as a cooperatively sponsored research organization; the cooperating parties being the Montana Livestock Sanitary Board and the Montana Agricultural Experiment Station. An Advisory Committee was appointed for the guidance of the Head of the Veterinary Research Laboratory. This committee consisted of the Executive Officer of the Livestock Sanitary Board, the Director of the Agriculture Experiment Station, a representative of the Stockgrower's Association, one from the Montana Wool Grower's Association, and the Head of the Veterinary Research Laboratory. The Director of the Agricultural Experiment Station was selected as the presiding officer. This committee has functioned throughout the intervening years to the benefit of the program of the Research Laboratory.

The Montana Livestock Sanitary Board Laboratory and the Veterinary Research Laboratory might seem to be needless duplication. This is far from the case. Each has its own separate and important functions, and the most efficient type of cooperation exists between the two organizations. This is partly due to the fact that the Executive Officer of the Livestock Sanitary Board is also a member of the Advisory Committee of the Veterinary Research Laboratory. The function of the Sanitary Board is to control animal and poultry diseases. The function of the Research Laboratory is that of investigation and research into unknown, unsolved problems that do not fall within the realm of control work. Unknown problems in the diagnosis of diseases, with which the veterinarians of the Sanitary Board come in contact, are referred to the Veterinary Research Laboratory for investigation. Likewise, when there is need for the Research Laboratory to use field men to follow up certain research projects or to obtain materials or data for investigational purposes, this work is referred to the veterinarians employed by the Livestock Sanitary Board.

Throughout the years, this type of cooperation has functioned most successfully, and I believe it one striking example of the benefits to be obtained from good, whole-hearted, sincere cooperation between existing agencies. The Montana organization for animal disease control and range livestock disease research is very highly rated in this country, and the cooperation between the two units is generally acknowledged to be excellent.

The Montana Veterinary Research Laboratory has the same group of research projects under study as last year. An account of the progress will be found in the following pages.

One item of major interest and one that has consumed a great deal of time is the construction of our new Veterinary Research Laboratory building. It is approximately half completed at present writing—the roof, walls, and plumbing installations being completed. The schedule calls for completion by the new year so that the first half of 1953 should be occupied with the problem of moving to new quarters.

RED WATER OR ICTEROHEMOGLOBINURIA

Attempts to separate the "non-specific anti-lecithinase" from the true immune anti-lecithinase were only partly successful, so that the **in vitro** turbidimetric method for measuring the circulating antitoxin of vaccinated animals is still reliable only for the higher degrees of immunity. However, it was found that red cell hemolysis could be used as a measure of toxin activity, and that the non-specific anti-lecithinase did not interfere with antibody determinaion. A series of livers from normal fat steers killed for beef were examined for **C. hemolyticum**; this organism was recovered only from the liver of one animal, which was the only one showing demonstrable antitoxin. A series of rabbits vaccinated with 5 different types of attenuated toxin failed to develop significant antitoxic titers.

UROLITHIASIS

An experiment was set up to obtain information on the possible effect of very limited water consumption in the production of urinary calculi. Twelve weaner steers were carried for 3 months on 6 quarts of water per head per day, which was found to be the minimum compatible with normal life. There was slight loss in weight, change in feces to small dry stools, reduction in urine volume, slight increase in specific gravity of urine, slight increase in precipitation of the urine, no increase in urine silica, no increase in sediment, and no evidence of stone formation.

During 4 weeks of the period on low water consumption, 4 of the steers were given daily doses of sodium silicate in their water. This did not significantly increase the amount of silica in the urine.

Four clinical cases of urolithiasis were studied at the Laboratory. The blood vitamin A level was low in 3 of these cases. Urine collected in one case showed the same silica content as experimental steers.

Kidneys from 3 normal steers, 2 bulls, and 1 heifer examined post mortem showed stones in 3 of the 6 animals. Five of these animals showed small stones in the bladder. Eleven pairs of kidneys from steer calves killed as large vealers at Butte showed no stones.

THE CALCIUM, PHOSPHORUS, MAGNESIUM, AND VITAMIN A CONTENT OF THE BLOOD OF HEREFORD COWS AND THEIR CALVES AT THE U. S. RANGE LIVESTOCK EXPERIMENT STATION

The blood sampling of the thirty experimental cattle at Miles City has been continued at 28-day intervals. The blood has been examined for phophorus, calcium, magnesium, carotene, and vitamin A. The average phophorus for all the cattle did not drop as early as in 1950, remaining above 4 mg/100 until November 1, but dropping to a low of 2.3 mg/100 in April. The vitamin A average never went below 21 y/g. The magnesium was lower in March and April than at any other time, as in 1949 and 1950.

The correlation, if any, between these blood results, the weights of the cows, the calf production, and the grass and soil analyses will be worked out at the end of the five-year period in 1953.

VIBRIONIC ABORTION

The work has been completed on the method of preparing agglutination antigen. It has been found that the yeast autolysate medium reported in 1951 as obviating the necessity of adding CO2 to the atmosphere over the culture, has not been satisfactory for antigen producion, although the amount of growth was satisfactory. We have therefore, settled on 1.5% agar plus 10% horse serum, with addition of 15% CO2, to the atmosphere in the culture bottle.

Rabbits have been immunized against representative strains of the several serological types recognized, and the typing of all strains on hand will soon be completed.

Several manuscripts now in the process of preparation should be published within the coming year.

PARASITES OF SHEEP

Previous work on the effect of pure infections of **Nematodirus** naturally acquired and experimentally induced produced only negative results in 4-to-6-month-old lambs.

In 1951 a group of 14-month-old lambs and their mothers were placed on a 1¾-acre pasture. This pasture had been heavily contaminated the previous summer by sheep infected with **Nematodirus.** During the grazing season, the lambs built up heavy infections of **Nematodirus** worms as indicated by fecal counts. No significant effect of the worms was noted on the lambs even though the pasture was overstocked and overgrazed.

ULCERATIVE DERMATOSIS

A study of ulcerative dermatosis has been continued through experimental inoculation of sheep and developing chick embryos.

We have been unable to demonstrate immunity in sheep vaccinated 13-14 months previously with a crude unpurified virus. These results may not be verified following the use of a pure-virus vaccine.

No indication of growth has been obtained by the passage of bacteria-free tissue suspensions into the developing chick embryo regardless of the embryo age or the method of inoculation.

MASTITIS OF SHEEP

Investigation was continued on the carrier phase and the cystic or nodular type of udders with our Laboratory ewes. Some experimental treatment with different antibiotics and sulfonamide products has been conducted. Bacteriological studies with the causative organism **Pasteurella mastitidis** have been continued.

Some progress has been made in the summarizing of our experimental data on the entire problem of mastitis.

REPORT OF THE BACTERIOLOGIST & PATHOLOGIST MONTANA LIVESTOCK SANITARY BOARD

During the past year and seven months there were 92,906 specimens examined in the Bacteriological and Pathological Laboratory. The material consisted of blood, smears, skin scrapings, exudates, vaccines, pus, feces, plants, parasites, tissues, milk, cream and water.

The following species of animal and bird life represented by these specimens include: horses, cattle, sheep, swine, goats, dogs, cats, deer, elk, raccoons, mink, rabbits, chinchillas, guinea pigs, skunks, squirrels, gophers, chickens, turkeys, geese, pheasants, ducks, canaries, parakeets and sparrows.

Following is a classified list of diagnoses made, showing the number of positive, negative and suspicious findings in each case:

		Diagnoses from Dec. 1, 1950 to Nov. 30, 1951			Diagnoses from Dec. 1, 1951 to June 30, 1952		
		Pos.	Neg.	Susp.	Pos.	Neg.	Susp.
Abortion, vibrionic	Cattle						4
Abortion, vibrionic	Sheep	5			6		
Abscesses, Corynebacterium	Cattle	3			2		
Abscesses, Corynebacterium	Sheep				2		
Abscesses, Corynebacterium	Swine	1					
Abscesses, mixed bacteria	Cattle	6			7		
Abscesses, mixed bacteria	Elk	1					
Abscesses, mixed bacteria	Horses	1			1		
Abscesses, Staphylococcus	Horses				1		
Abscesses, Staphylococcus	Swine	1					
Actinobacillosis	Cattle	9			1		
Actinobacillosis	Swine	2					
Agranulocytosis (Trichloroethylene—processed soybean poisoning) differential count	Cattle				41		
numerical count	Cattle				24		
Anaplasmosis, blood smears	Cattle	15	32		8	10	
Anaplasmosis, anti-complementary	Cattle	24					
Anaplasmosis, *complement—fixation	Cattle	167	2,187	16	4	11	
Anemia	Swine	2			4		
Anthrax	Cattle		6			10	
Arthritis, Staphylococcus	Turkeys	8					
Aspergillosis	Chickens				9		
Aspergillosis	Turkeys	2					
Asphyxiation	Chickens	54					

		Diagnoses from Dec. 1, 1950 to Nov. 30, 1951			Diagnoses from Dec. 1, 1951 to June 30, 1952		
		Pos.	Neg.	Susp.	Pos.	Neg.	Susp.
Bacillary icterohemoglobinuria (red water)							
agglutination test	Cattle	39	427	96	51	378	37
tissue examination	Cattle	5			3	2	
Blackhead	Chickens	2			1		
Blackhead	Pheasants	1					
Blackhead	Turkeys	28			3		
Blackleg	Cattle	9	18		6	12	
Brisket disease	Cattle				2		
Brucellosis, agglutination test	Cattle	1,873	43,750	2,365	1,508	27,040	1,152
Brucellosis, agglutination test	Goats		48			40	
Brucellosis, agglutination test	Horses	3			2	1	
Brucellosis, agglutination test	Milk	102	891		8	647	4
Brucellosis, agglutination test	Swine	10				23	
Brucellosis, tissue cultures	Cattle	5	9		3	14	
Brucellosis, tissue cultures	Swine					1	
Chick tremors	Chickens	6			2		
Cholera	Swine	6			2		
Cholera	Turkeys	2			8		
Colibacillosis	Cattle				4		
Colibacillosis	Chickens	8			39		
Colibacillosis	Sheep				2		
Colibacillosis	Swine				2		
Colibacillosis	Turkeys	6					
Contagious ecthyma	Sheep	1					
Coryza	Chickens	7			4		
Coryza	Turkeys	2					
Diarrhea, virus	Cattle	6			1		
Distemper	Dogs	1					
Distemper	Cats				2		
Distemper	Horses	1					
Distemper	Mink	3					
Echinococcus	Cattle	3	1		1		
Egg bound	Chickens	5			2		
Encephalitis	Dogs	2					
Encephalomalacia	Chickens	3					
Enteritis, gastro	Dogs				2		
Enteritis, hemorrhagic	Cattle				1		
Enteritis, mucoid	Cattle	1			1		
Enteritis, necrotic	Swine	2			1		
Enterotoxemia	Cattle	7	6		1	2	
Enterotoxemia	Sheep	15	12		20	12	
Erysipelas, agglutination test	Swine	7	2		4	1	
Erysipelas, tissue cultures	Swine	19	8		8	3	
Erysipelas, tissue cultures	Turkeys	1					
Fitness for food	Beef	9			2		
Fitness for food	Elk	2					
Fitness for food	Fowl	3					
Fitness for food	Milk	10					
Fitness for food	Pork	4			4		
Fitness for food	Venison	1					
Frostbite	Rabbits	1					
Gizzard erosion	Turkeys	3					
Gout	Chickens	3					
Granuloma	Cattle				2		
Granuloma	Horses				2		
Hemoglobinuria, post-parturient	Cattle	1			1		
Hepatitis	Dogs	2			3		
Hepatitis	Raccoon	1					
Hepatic coccidiosis	Rabbits	1			1		
Identification of specimens:							
" Bedbug (Cimex lectularius)		10					
" Buckwheat plant		1					
" Plant leaf					1		
" Ticks (Dermacentor albipictus)		2			1		
" Water bug (Belostoma bakeri)		5					
Improper freezing	Chickens	7					
Improper handling	Chickens				6		
Infectious anemia (agglutination test)	Horses		2				
Infectious bronchitis	Chickens	22			26		
Infectious disease	Cattle		35			24	
Infectious disease	Cats		1				
Infectious disease	Chickens		30			31	
Infectious disease	Deer					1	
Infectious disease	Dogs					1	
Infectious disease	Geese		1				
Infectious disease	Goats		1				

		Diagnoses from Dec. 1, 1950 to Nov. 30, 1951			Diagnoses from Dec. 1, 1951 to June 30, 1952		
		Pos.	Neg.	Susp.	Pos.	Neg.	Susp.
Infectious disease	Horses		2	1			
Infectious disease	Pheasants		4				
Infectious disease	Rabbits		1			2	
Infectious disease	Sparrows		3				
Infectious disease	Swine		6			3	
Infectious disease	Turkeys		5				
Johne's disease	Cattle		1				
Keratitis	Cattle		1				
Laryngitis	Cattle				2		
Laryngotracheitis	Chickens	6			1		
Leptospirosis, agglutination test	Cattle				1		
Leptospirosis, tissue cultures	Cattle	1				1	
Leukosis	Chickens	35			32		
Listerellosis	Cattle		1			4	
Listerellosis	Sheep				9		
Lymphadenitis	Cattle				1		
Malignant edema	Cattle	23	4		19	6	
Malignant edema	Sheep				1		
Malignant edema	Swine	1					
Metritis	Cattle				2		
Metritis	Swine	1					
Navel ill	Cattle				2		
Navel ill	Sheep	3			12		
Necrobacillosis	Cattle	2			1		
Neoplasms	Cattle	3			7		
Neoplasms	Chickens	3			2		
Neoplasms	Dogs	3			2		
Neoplasms	Horses	1			1		
Normal specimens	Canary				1		
Normal specimens	Chickens				11		
Nutritional deficiency	Chickens	37			17		
Nutritional deficiency	Rabbits	1			1		
Nutritional deficiency	Swine	1					
Nutritional deficiency	Turkeys	3			8		
Omphalitis	Turkeys	6			5		
Panleucopenia	Cats	1			2		
Parasites, external:							
Parasites, mange mites	Swine					3	
Parasites, mange, chorioptic	Cattle	3	5				
Parasites, mange, demodectic	Dogs	1					
Parasites, mange, demodectic	Swine				1		
Parasites, mange, ear	Cats	2					
Parasites, mange, ear	Rabbits	1					
Parasites, mange, sarcoptic	Dog	1					
Parasites, lice	Cattle	3					
Parasites, lice	Chickens	8					
Parasites, lice	Horses				1		
Parasites, microfilaria	Sheep	2					
Parasites, ringworm	Cattle	9			2		
Parasites, ringworm	Horses	4					
Parasites, internal: fecal examination	Cattle	33	2		12	2	
Parasites, fecal	Cats	4	2				
Parasites, fecal	Chinchilla	1			1		
Parasites, fecal	Dogs	11	17		12	8	
Parasites, fecal	Goats	1					
Parasites, fecal	Horses	23	3		9	1	
Parasites, fecal	Rabbits	11					
Parasites, fecal	Sheep	22			7		
Parasites, fecal intestinal examination:	Swine	1					
Parasites, ascarids	Chickens	8			3		
Parasites, ascarids	Swine	1					
Parasites, coccidial oocysts	Canary				1		
Parasites coccidial	Cattle	9			7		
Parasites, coccidial	Chickens	94			29		
Parasites, coccidial	Pheasants	2					
Parasites, coccidial	Rabbits	4					
Parasites, coccidial	Sheep	1					
Parasites, coccidial	Turkeys	9			20		
Parasites, Nematoda	Sheep	3					
Parasites, Strongylidae	Horses				1		
Parasites, Taeniidae	Cattle	3					
Parasites, Taeniidae	Chickens	11			6		
Parasites, Taeniidae	Turkeys	2					
Parastes, tissue examination:							
Parasites, Multiceps seralis	Rabbits				1		

		Diagnoses from Dec. 1, 1950 to Nov. 30, 1951			Diagnoses from Dec. 1, 1951 to June 30, 1952		
		Pos.	Neg.	Susp.	Pos.	Neg.	Susp.
Parasites, sarcosporidiae	Cattle	1					
Pericarditis	Cattle	1					
Pericarditis	Chickens	1					
Peritonitis	Cattle	1			2		
Peritonitis	Chickens	8			3		
Peritonitis	Dogs				1		
Perosis	Chickens	4			1		
Perosis	Turkeys	1			4		
Phlegmon	Cattle	1			1		
Photosensitization	Cattle				2		
Pneumoencephalitis (Newcastle disease)							
Pneumoencephalitis hemagglutination—inhibition test	Chickens	21	87		6	82	
Pneumoencephalitis hemagglutination—inhibition test	Ducks					1	
Pneumoencephalitis hemag glutination—inhibition test	Turkeys		6			6	
Pneumonia	Parakeets				3		
Pneumonia, gangrenous	Sheep	1					
Pneumonia, mixed infection	Chickens	2					
Pneumonia, mixed infection	Guinea pigs	2					
Pneumonia, mixed infection	Pheasants	2					
Pneumonia, Pasteurella	Cattle	23			21		
Pneumonia, Pasteurella	Chinchilla				1		
Pneumonia, Pasteurella	Rabbits	3					
Pneumonia, Pasteurella	Sheep	5			13		
Pneumonia, Pasteurella	Swine	1			1		
Poison, detergent	Sheep				1		
Poison, disinfectant	Chickens	8					
Poison, forage	Sheep	3					
Poison, sweet clover	Cattle	2			1		
Pox, cow	Cattle	1			1		
Pox, fowl	Chickens	5					
Pullet disease	Chickens	14			11		
Pseudotuberculosis	Deer	2					
Pullorum disease, (agglutination test)	Chickens	69	68		13	20	
Pullorum disease, (agglutination test)	Ducks	3	4				
Pullorum disease, (agglutination test)	Turkeys	4	64		3		
Pullorum disease, (tissue cultures)	Chickens	49	9		108	13	
Pulmonary emphysema	Cattle	2			2		
Pyelonephritis	Cattle	3					
Pyometra	Cattle				1		
Rabies	Cattle		3			4	
Rabies	Cats	2	19			8	
Rabies	Dogs	9	42			13	
Rabies	Gophers		1				
Rabies	Horses		1				
Rabies	Muskrat					1	
Rabies	Rabbits		1				
Rabies	Skunks		2			2	
Rabies	Squirrel		1				
Rhinitis, atrophic	Swine				2		
Ruptured air sac	Chickens				1		
Ruptured oviduct	Chickens				1		
Salmonellosis	Cattle	1			3		
Salmonellosis	Chinchilla				2		
Salmonellosis	Sheep				4		
Salmonellosis	Swine	10			6		
Sinusitis	Turkeys	2			4		
Spermatazoa, viability examination	Cattle				4		
Streptococcus infection	Cattle	4			5		
Streptococcus infection	Dog	1					
Streptococcus infection	Swine				1		
Suffocation	Chickens				3		
Tetanus	Cattle	3			1		
Tetanus	Sheep	6			1		
Tetany, grass	Cattle				2		
Tick paralysis	Dogs	1					
Torticollis	Rabbits				1		
Toxemia	Cattle	1					
Toxemia	Rabbits	1			1		

		Diagnoses from Dec. 1, 1950 to Nov. 30, 1951			Diagnoses from Dec. 1, 1951 to June 30, 1952		
		Pos.	Neg.	Susp.	Pos.	Neg.	Susp.
Trauma	Cattle	3			3		
Trauma	Cats	2					
Trauma	Chickens	20			7		
Trauma	Dogs				2		
Trauma	Ducks				1		
Trauma	Parakeets				1		
Trauma	Rabbits	2					
Trauma	Swine	1					
Trauma	Turkeys	1					
Trichomoniasis	Cattle		6				
Trichomoniasis	Horses		12				
Tuberculosis	Cattle		3			3	
Tuberculosis	Chickens	19			11		
Tuberculosis	Swine	2			1		
Tuberculosis	Turkeys	1					
**Tularemia (agglutination test)	Dogs		5				
Tularemia (tissue cultures)	Beaver					1	
Tularemia (tissue cultures)	Gophers	1					
Tularemia (tissue cultures)	Rabbits	1					
Unsatisfactory specimens: (tissues, blood, milk, poultry)		68			47		
Urethritis	Sheep				1		
Urinary calculi	Cattle	1					
Viability of vaccines		40			4		
Welchii infection	Cattle				1		
White muscle disease	Cattle	3			13		
Milk samples for bacterial count		1,160			498		
E. coli determination (plate)		419	641		144	354	
leucocyte determination					156		
Mastitis determination (smear)		470	763		248	314	
Ring test (brucellosis)		126	424		33	441	
laboratory pasteurization		54			5		
Cream samples for bacterial count		223			155		
Cream samples for E. coli determination (plate)		107	116		51	104	
Water samples for bacterial count		2			7		
Water samples for E. coli determination (plate)		2	1		4	3	
Empty bottles for sterility		2			2		
Total 12/1/50 — 11/30/51		6,027	49,797	2,477			
Total 12/1/51 — 7/1/52					3,743	29,669	1,193

Grand total of specimens from 12/1/50 to 7/1/52 was 9,770 positive, 79,466 negative, 3,670 suspicious.

*Complement-fixation tests for anaplasmosis were made by the U. S. Bureau of Animal Industry, Washington, D. C.

**Agglutination tests for tularemia were made by the State Board of Health Laboratories, Helena, Montana.

The anaerobic laboratory procedures used at the Veterinary Research Laboratory have been adopted, thus correlating the diagnostic procedures of the two laboratories. The necessary equipment to run complement-fixation tests for anaplasmosis has been obtained and in the future these tests will be run at the Livestock Sanitary Board Laboratory rather than at the Bureau of Animal Industry Laboratory in Washington, D. C. The Bureau Laboratory, however, will continue to furnish the antigen necessary for these tests.

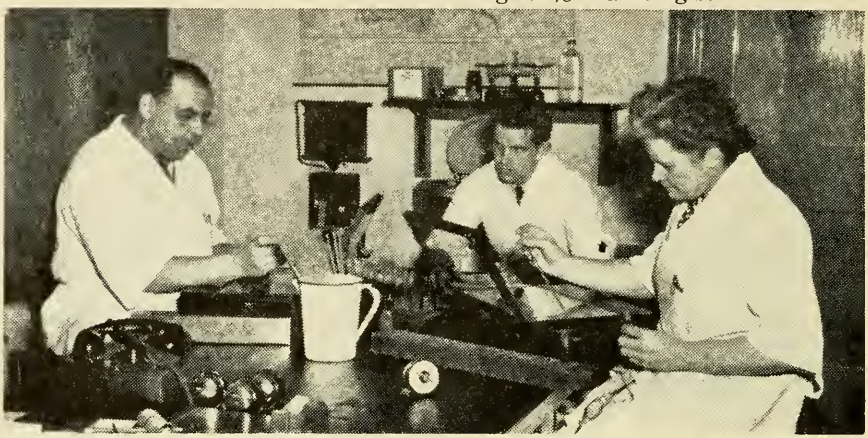
In addition to the usual conditions that we encounter from year to year, this last year we have found Type D **welchii** or **perfringens** in two cases in cattle. One case was a cow suffering from a severe enteritis and the other was a heifer suffering from pulmonary emphysema. To our knowledge, this is the first time that Type D **perfringens** has been isolated in cattle. This organism is most frequently found as a causative factor of enterotoxemia in lambs.

Corynebacterium pyogenes has been isolated from fetuses sent in from cows (in three different herds) which have aborted, indicating that this organism may be another entity to look for as the cause of abortion in cattle. **Brucella abortus** still remains the most common cause of abortion in cattle.

Recent literature has shown that toxic **coli** strains have been isolated from infant diarrhea cases in humans. On this premise, several strains of **E. coli** that were isolated from scouring calves have been tested and it has been found that two strains .026 and .03, were isolated in this laboratory, and have been identified as toxic strains. One of these is identical to those isolated from human infant diarrhea cases. Continuation of these studies is anticipated during the ensuing year.

With the increase in specimens received during the year, it has become increasingly difficult to do satisfactory work with our limited laboratory space and facilities. It is hoped that more laboratory space will be made available for continued work in the near future.

Respectfully submitted,
A. M. JASMIN, D. V. M.
Bacteriologist ⅞ Pathologist



TESTING FOR BRUCELLOSIS—One of the regular jobs of the Montana Livestock Sanitary Board Laboratory in Helena is the testing of blood samples for evidence of brucellosis, (undulant fever), which occurs in cattle and swine and may be contracted by human beings through meat or milk. Testing above, left to right, are Dr. Arthur M. Jasmin, Jim Glosser and Hazel Hammersland.

REPORT OF THE CHEMIST
MONTANA LIVESTOCK SANITARY BOARD

A total of 306 samples were received by the Chemical Laboratory for poison analyses between December 1, 1950, and June 30, 1952. These samples were mainly taken from bovines, but there were also samples forwarded to this laboratory from dogs, pigs, horses, sheep, poultry, and a few from fur-bearing animals. A total of 566 analyses was performed on these samples. Arsenic was the main offender of the poisons with lead claiming some victims among the livestock population. Strychnine poisoned a number of dogs in the State.

One hundred and seven miscellaneous samples were also received for detection of poison. These samples were suspected of poisoning livestock or pets and consisted mainly of grain samples, samples taken from smelters, candy and bones. One hundred and seventy analyses were made on these samples.

There were 66 samples received by this laboratory for various analyses other than those for poison. Twenty-seven of these samples were water samples analyzed for mineral content. These samples are analyzed for sulfates, carbonates, bicarbonates, chlorides, calcium, silicates, iron and aluminum, magnesium and total solids. Water which contains an excessive amount of Epsom and Glauber salts is rejected by this laboratory as unfit for livestock consumption because of its laxative effect on the animals. This laboratory is also increasing its analyses of oat hay samples for nitrates in order to prevent loss of cattle from this source. Several

samples have been checked for selenium, but so far all samples analyzed have been negative.

In the past year and a half there has been a tremendous increase in the number of blood samples analyzed by this laboratory. These blood samples were analyzed for phosphorus, calcium, carotene and vitamin A. A total of 1,356 analyses were performed on 400 different samples. Many of the samples analyzed were deficient in phosphorus and vitamin A. A calcium deficiency is much less common in Montana. The analysis of blood serum for minerals and vitamin A is an expensive and time-consuming job and involves the use of valuable equipment. This laboratory has now purchased a mill for the preparation of feed samples and in the near future will be ready to analyze feeds, as well as blood serum, for carotene. We have been asked to analyze feeds in the past, but have been unable to do this because of a lack of proper equipment.

Chemical analyses on milk samples occupied a very important place in the work of the Chemical Laboratory in the past year and a half. There were a total of 1,974 individual samples tested in that time including milk, chocolate milk, skim milk, cream, and half-and-half. A total of 9,183 analyses were run on these 1,974 individual samples. Of a total of 1,105 samples checked for proper pasteurization by the phosphatase test, 27 samples or 2.4 per cent were found to be improperly pasteurized.

Respectfully submitted,
FRANK J. PEACOCK,
Chemist

MILK
December 1, 1950 — June 30, 1952

		Dec. 1, 1950 to Nov. 30, 1951		Dec. 1, 1951 to June 30, 1952	Dec. 1, 1950 to June 30, 1952
MILK					
For butterfat content	(including 25 unofficial samples)	1087	(including 10 unofficial samples)	454	1541
For solids not fat	(including 21 unofficial samples)	1053	(including 10 unofficial samples)	453	1506
For total solids	(including 21 unofficial samples)	1053	(including 10 unofficial samples)	453	1506
For Lactometer reading	(including 21 unofficial samples)	1053	(including 10 unofficial samples)	453	1506
For sediment test	(including 21 unofficial samples)	1049	(including 10 unofficial samples)	453	1502
For phosphatase test, indicating proper pasteurization	(including 18 unofficial samples)	598	(including 10 unofficial samples)	132	730
For phosphatase test, indicating improper pasteurization		15		2	17
Acidity test		42			42
Chlorides test		42			42
CHOCOLATE MILK					
For butterfat content	(including 2 unofficial samples)	11		4	15
For phosphatase test, indicating proper pasteurization	(including 2 unofficial samples)	12		4	16
For phosphatase test, indicating improper pasteurization		1			1
SKIM MILK					
For butterfat content		8		4	12
For phhosphatase test, indicating proper pasteurization		6		4	10
CREAM					
For butterfat content	(including 6 unofficial samples)	242	(including 4 unofficial samples)	137	379
Phosphatase test, indicating proper pasteurization		176	(including 3 unofficial samples)	114	290
Phosphatase test, indicating improper pasteurization		7		2	9
HALF & HALF					
For butterfat content		14		18	32
Phosphatase test, indicating proper pasteurization		14		18	32
TOTAL (Representing 1,343 individual samples)		6,483	(Representing 631 individual samples)	2,705	9,188

BLOOD SAMPLES FOR CHEMICAL ANALYSES

December 1, 1950 — June 30, 1952.

TYPE OF BLOOD	Dec. 1, 1950—Nov. 30, 1951 Phosphorus	Calcium	Magnesium	Carotene	Vit. A	Total Samples	Total Analyses	Dec. 1, 1951 — June 30, 1952 Phosphorus	Calcium	Magnesium	Carotene	Vit. A	Total Samples	Total Analyses	Dec. 1, 1950 June 30, 1952 Total Samples	Total Analyses
BOVINE	195	163	36	151	153	212	698	181	165	1	150	149	184	646	396	1,344
OVINE	1	1	1		1	1	4								1	4
PORCINE	1	1	1	1	1	1	5								1	5
BOVINE LIVER				1	1	1	2								1	2
CANINE									1				1	1	1	1
TOTAL	197	165	38	153	156	215	709	181	166	1	150	149	185	647	400	1,356

STOMACH CONTENTS, TISSUES, ETC., FOR POISON

December 1, 1950 — June 30, 1952

TYPE	Dec. 1, 1950—Nov. 30, 1951 Arsenic Pos.	Neg.	Lead Pos.	Neg.	Strychnine Pos.	Neg.	Cyanides Pos.	Neg.	Nitrates Ps	Ng	Ergot Ps	Ng	Phenols Ps	Ng	Ceresan Ps	Ng	Zinc Ps	Ng	Mercury Ps	Ng	Tot Smps	Tot Anlys	Dec. 1, 1951—June 30, 1952 Arsenic Pos	Neg	Lead Pos	Neg	Strychnine Pos	Neg	Ceresan Pos	Neg	Mercury Pos	Neg	Total Samples	Total Analyses	Total Samples	Total Analyses
BOVINE	17	104	6	96		3		3		6		1		2				1		1	127	240	10	47	1	49		3		1			55	111	182	351
CANINE		20		11	12	24		4													48	71		15		10	4	25		1		1	30	55	78	126
PORCINE	2	8	1	8								1									11	20		1		1							1	2	12	22
EQUINE		4		4		2		1		2											9	13												9	13
OVINE		8		8				2													8	18		5		5							5	10	13	28
AVIAN		6		1		2										1				1	6	11		2		1				2			2	5	8	16
FUR-BEARING		3		3		1										1					3	8		1		1							1	2	4	10
TOTAL	19	153	7	131	12	32		10		8	1	1		2		2		1		2	212	381	10	71	1	67	4	28		3		1	94	185	306	566

MISCELLANEOUS SAMPLES FOR POISON

December 1, 1950 — June 30, 1952.

MATERIAL	Dec. 1, 1950—Nov. 30, 1951 Arsenic Pos	Neg	Lead Pos	Neg	Strychnine Pos	Neg	Nitrates Pos	Neg	Ergot Pos	Neg	Mercury Pos	Neg	Cyanides Pos	Neg	Ceresan Pos	Neg	Phenols Pos	Neg	Zinc Pos	Neg	Tot. Smps	Tot. Anlys	Dec. 1, 1951—June 30, 1952 Arsenic Pos.	Neg.	Lead Pos.	Neg.	Strychnine Pos.	Neg.	Mercury Pos.	Neg.	Ergot Pos.	Neg.	Ceresan Pos.	Neg.	Zinc Pos.	Neg.	Total Samples	Total Analyses	Total Smlps	Total Anlys
Pan						1															1	1															1	1
Oat Straw								1	1		1										3	3															3	3
Wheat		1		1		1						1				1					2	5		1		1									1	2	3	7
Paint		4	3	2																	5	9															5	9
Bran	1	2		2												1					3	6	1	2		2				1		1				4	8	7	14
Samples near mine		10		2						1	3		4								10	20	1	3												4	4	14	24
Hay	1						2														2	3															2	3
Meat		1			2	4															6	7		2		1		3							4	6	10	13
Metal pieces		1	1																		1	2															1	2
Candy						1															1	1						1	1							2	2	3	3
Roof paper		1		1																	1	2															1	2
Cooper's dip		1		1																	1	2															1	2
Bones						2															2	2		1		1										1	2	3	4
Treated post		1																1			1	2		1												1	1	2	3
Sprayed weeds	1	1																			2	2																2	2
Samples from smelter	6	5	3	1																	11	15	1	1												2	2	13	17
Water	2	15	2	9																	17	28		5		1		1								5	7	22	35
White Powder		2		1																	2	3	1	3	1	1		1								5	7	7	10
Feed		1		1																	1	2		4		2				2	1	1	1	1	6	12	7	14
TOTAL	11	46	9	21	2	11	1	3	1	1	4		4		2		1				72	115	4	23	1	9	1	6	3	1	2	2	1	1	35	53	107	168

MISCELLANEOUS ANALYSES OTHER THAN POISONS
December 1, 1950 — June 30, 1952

	12-1-50 11-30-50	12-1-51 6-30-52	TOTAL
Water samples for mineral analyses	22	5	27
Material found in feed-positive urea	1		1
Spraying chemical-physical injury	1		1
Oat, hay quantitative determination of nitrates	5	9	14
Quantitative analysis of sample of phosphate	1		1
Sample for available chlorine	1		1
Hair samples from cow (negative for selenium)	1		1
Blood samples from cows-negative for selenium	4	1	5
Weed samples (negative for selenium)	3		3
Urine sample from cow (negative for selenium)	1	1	2
Material in rumen contents (identified as copper sulphate)	1		1
Examination of milk sample for contamination		1	1
Oat hay for protein		1	1
pH of urine and intestinal contents		2	2
Albumin in urine		1	1
Acetone in urine		1	1
Sugar in urine		1	1
Uric acid on hair sample		1	1
Ammonium urate on hair sample		1	1
TOTAL	41	25	66

INVESTIGATIONS SYNOPTICALLY ARRANGED INCLUDING COOPERATIVE WORK WITH THE UNITED STATES BUREAU OF ANIMAL INDUSTRY

	12/1/50 11/30/51	12/1/51 6/30/52
HORSES		
Tested for brucellosis	3	2
Reactors	3	1
ENCEPHALOMYELITIS		
Number inspected	72	21
Number of cases	21	6
MISCELLANEOUS INSPECTIONS		
Total	718	24
INSPECTIONS FOR INTERSTATE SHIPMENT		
Clinically inspected	1,230	482
CATTLE		
TUBERCULOSIS		
Dairy cattle tested	12,209	6,085
Reactors (showing postmortem lesions indicative of tuberculosis)	1	0
Percentage of reactors	.0081	0
Stock cattle tested	7,833	3,768
Reactors	0	0
ACCREDITED TUBERCULOSIS-FREE HERDS		
Herds tested	5	1
Cattle tested	604	41
Reactors	0	0
TESTS FOR INTERSTATE SHIPMENT		
Tuberculin tested	3,248	951
Reactors	0	0
TOTAL CATTLE TESTED FOR TUBERCULOSIS		
Number	23,894	10,845
Reactors	1	0
Percentage of reactors	.0041	0
CATTLE INSPECTED AT DESTINATION		
Number	11,229	3,046
SCABIES		
Number inspected	134	14
Number cases	43	0
ACETONEMIA		
Inspected	82	87
Cases	25	6
ACTINOMYCOSIS		
Inspected	14,062	476
Cases	140	27
BACILLARY ICTEROHEMOGLOBINURIA (Red Water)		
Inspected	151	538
Cases	21	20
Vaccinated	9,477	6,377
BLACKLEG		
Inspected	995	294
Cases	35	21
Vaccinated	115	352

	12/1/50 11/30/51	12/1/51 6/30/52
BRUCELLOSIS		
Blood samples tested in laboratory	47,988	29,700
Blood samples tested in the field	20,583	14,614
Positive reactors	2,836	2,116
Percentage of reactors	.047	.048
Suspicious reactors	2,933	1,577
Percentage of suspicious reactors	.042	.035
Dairy cattle tested for sale at saleyards and auctions	2,902	1,056
Positive reactors	78	28
Suspicious reactors	89	60
Calves officially vaccinated	70,827	87,283
COCCIDIOSIS		
Inspected	7,762	6,486
Cases	571	610
HEMORRHAGIC SEPTICEMIA AND PASTEURELLOSIS		
Inspected	12,320	7,196
Cases	2,908	542
Vaccinated	4,011	1,692
INFECTIOUS KERATITIS		
Inspected	4,516	1,806
Cases	504	616
JOHNE'S DISEASE		
Inspected and tested	15	33
Reactors	6	0
LICE		
Inspected	1,316	3,911
Cases	11	62
Dipped		3,800
MALIGNANT HEAD CATARRH		
Inspected	5	1
Cases	5	1
PODODERMATITIS		
Inspected	4,097	4,027
Cases	262	297
PULMONARY EMPHYSEMA		
Inspected	180	7
Cases	21	7
URINARY CALCULI		
Inspected	2,514	4,247
Cases	43	66
MISCELLANEOUS CATTLE INSPECTIONS		
Inspected for various diseases and conditions	28,707	47,870
INSPECTIONS FOR INTERSTATE SHIPMENT		
Inspected	216,879	67,886
SHEEP		
CONTAGIOUS ECTHYMA		
Inspected	5,222	1,690
Cases	238	251
ENTEROTOXEMIA		
Inspected	17,157	7,177
Cases	151	95
FOOT-ROT		
Inspected	140,331	101,855
Approximate number cases	1,032	1,821
LIP-AND-LEG ULCERATION		
Inspected	25,206	900
Cases	3,146	5
SCABIES AND MISCELLANEOUS DISEASES		
Inspected	91,068	62,965
Affected with scabies	0	0

IMPORTATION INSPECTIONS	12/1/50 11/30/51	12/1/51 6/30/52
Inspected and quarantined	129,691	75,864
Dipped for exposure to scabies	0	
Affected with scabies	0	
*Reinspection of imported sheep	84,256	42,207
*Includes contact native sheep and 1 or more reinspections.		
INSPECTED FOR INTERSTATE SHIPMENT		
Number	391,001	50,521
SWINE		
Inspected for various diseases	8,612	3,354
Premises infected with hog cholera	9	14
Inspected for Sarcoptic mange	17	0
Number infected	10	0
Inspected for interstate shipment	2,130	49
Inspected for erysipelas	3,588	355
Cases	570	61
Blood tested for brucellosis	10	23
Positive reactors	0	0
POULTRY		
Inspected	19,794	31,471
Tested for pullorum disease	54,231	31,564
Reactors	398	17
CATS		
Inspected for interstate shipment	30	13
Cases of rabies	2	0
Vaccinated against rabies	1,628	2,646
DOGS		
Inspected for various diseases	16,399	10
Cases of rabies	9	0
Vaccinated against rabies	16,384	7,451
Inspected for interstate shipment	944	512
GOATS		
Inspected for various diseases including brucellosis	48	40
Reactors	0	0
Inspected for interstate shipment	10	4
FOOT-AND-MOUTH DISEASE		
Number animals inspected		117,479
Number of cases		0
GRAND TOTALS:		
Total animals inspected and tested	1,404 320	768,612
Total fowls inspected and tested	74.025	63,035
Grand total:	1,478,345	831,647
MILES TRAVELLED BY DISTRICT DEPUTIES		
State-owned cars	81,575	29,689
Privately-owned cars	210,287	132,773
MILES TRAVELLED BY RESIDENT DEPUTIES AND LAY INSPECTORS		
State-owned cars	19,702	14,095
Privately-owned cars	59,457	29,964
Total miles	371,021	206,521

RECAPITULATION OF IMPORTATIONS
DECEMBER 1, 1950 to NOVEMBER 30, 1951

STATE	Health Certif's.	Test Charts	Horses	Cattle H. C.	Cattle T. C.	Sheep	Swine	Dogs	Misc.
Canada	141	189	191	1797	7626	8700	1	10	
Alaska	4							4	
Arizona	50	4	16	7995	4	1236		9	
Arkansas	3					176		1	
California	53	2	14	3013	24	1		83	1
Colorado	99	39	20	3484	113	11734	577	22	3
Florida	2							2	
Georgia	1							1	
Idaho	226	1	18	10874	3	20002	40	50	3
Illinois	21	17	1	5	32		2	17	
Indiana	5		1				3	2	
Iowa	50	13		81	738	225	6	44	
Kansas	22	22		993	55	5026	515	3	
Kentucky	1							1	
Louisiana	3			2325				1	
Maryland									
Massachusetts		1			1				
Michigan	5	2		3	8		3	4	
Minnesota	73	15	10	472	141	1618	233	45	
Missouri	16	8	8	180	50			12	
Mississippi	2			18				1	
Nebraska	83	25	17	1825	82	280	2	47	1
Nevada	4		4	74					
New Jersey		1			3				
New Mexico	86		80	8657		330		2	
New York									
North Dakota	367	85	15	8118	1773	3739	637	21	2
Ohio	9	1		1			2	9	
Oklahoma	11	5	20	948	5			4	
Oregon	194	2	79	387	12	12960		22	1
South Dakota	199	11	30	3250	90	17024	408	11	125
Tennessee	1			1					
Texas	168	2	70	40524	31	3134		12	
Utah	41		22	1682		97		11	
Vermont	1		1						
Washington	316	17	51	2809	324	42941	23	245	8
Wisconsin	64	26	2	527	249			24	1
Wyoming	518	41	91	11554	759	37908	271	30	
TOTAL	2839	529	761	111597	12122	167131	2723	750	145

RECAPITULATION OF IMPORTATIONS
DECEMBER 1, 1951 to JUNE 30, 1952

STATE	Health Certif's.	Test Charts	Horses	Cattle H. C.	Cattle T. C.	Sheep	Swine	Dogs	Misc.
Canada	17	9	37	117	245				
Alaska	2							3	
Arizona	9		1	291				3	
Arkansas	11		8	221				4	
California	38	1	2	1056	1	12073		16	4
Colorado	52	17	7	1313	146	1662		11	4
Florida	4		1	160				2	
Georgia	1			85					
Idaho	163	5	20	8967	47	5828	22	26	
Illinois	14	2		14	6	4		7	
Indiana	1		6						
Iowa	33	8		27	56		8	27	
Kansas	6	11	12	394	78			3	
Kentucky									
Louisiana									
Maryland		1							1
Massachusetts									
Michigan	3							3	
Minnesota	53	11		516	179		5	40	
Missouri	8	1	3		1			4	1
Mississippi	1							1	
Nebraska	32	15	9	767	58		1	12	
Nevada	5		12	11				8	
New Jersey	1	1		1	1				
New Mexico	19		4	1816					
New York	1			15					
North Dakota	155	12	10	4674	139	3373	146	14	
Ohio	6							6	
Oklahoma	5		17					1	
Oregon	187	2	8	1721	16	18292		18	
South Dakota	34	2	3	234	112	6936	1	3	
Tennessee	1		1						
Texas	76	11	19	11377	159			6	3
Utah	27		27	1364		1202		10	
Vermont									
Washington	109	6	28	406	27	79335	56	166	
Wisconsin	15	18	2	178	100			9	
Wyoming	242	31	51	4210	135	10289	56	17	5
TOTAL	1331	163	288	39938	1506	138994	295	420	18

NON-CIRCULATING